Chore-Tronics® 2 Control (Breeder Edition)

Installation & Operator's Instruction Manual

August 2006 **MT1912A**

Chore-Time Warranty

Chore-Time Equipment (“Chore-Time”) warrants each new Chore-Time product manufactured by it to be free from defects in material or workmanship for one year from and after the date of initial installation by or for the original purchaser. If such a defect is found by the Manufacturer to exist within the one-year period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Manufacturer or Warranty will be void**.
2. Warranty is void if **all components** of the system are not original equipment supplied by the **Manufacturer**.
3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.
4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance, or from lightning strikes, electrical power surges or interruption of electricity, shall not be considered defects under the Warranty.
5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

The **Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **“Consequential”** or **“Special Damages”** *as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.*

THIS WARRANTY CONSTITUTES THE MANUFACTURER’S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

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Effective: **September 2006**

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Thank You

The employees of Chore-Time Equipment would like to thank your for your recent Chore-Time purchase. If a problem should arise, your Chore-Time distributor can supply the necessary information to help you.

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* Legend: C = Customer (end user), D = Distributor (sales), I = Installer of equipment

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General

Support Information

The Chore-Tronics® 2 Controls are used to control the Climate in a structure to insure efficient growth of Livestock. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury.

This manual is designed to provide comprehensive planning, installation, safety, operation, and parts listing information. The Table of Contents provides a convenient overview of the information in this manual. The Table of Contents also specifies which pages contain information for the sales personnel, installer, and consumer (end user).

Safety Information

Caution, Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

Using the equipment for purposes other than specified in this manual may cause personal injury and/or damage to the equipment.

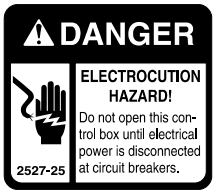
Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety signs. Follow recommended precautions and safe operating practices.

Keep safety signs in good condition. Replace missing or damaged safety signs.

Decal Descriptions

DANGER: Electrical Hazard


DANGER
ELECTROCUTION HAZARD!
Do not open this control box until electrical power is disconnected at circuit breakers.
2527-25

Disconnect electrical power before inspecting or servicing equipment unless maintenance instructions specifically state otherwise.

Ground all electrical equipment for safety.

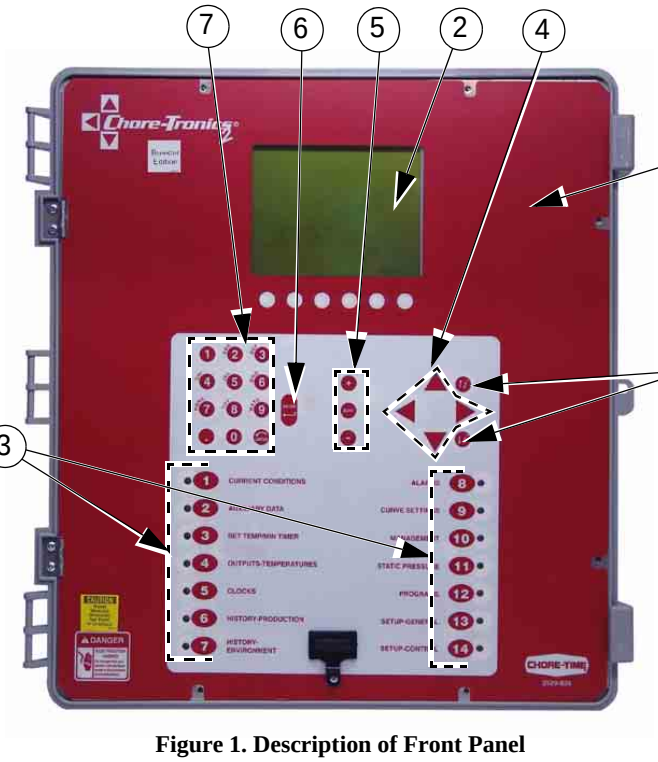
All electrical wiring must be done by a qualified electrician in accordance with local and national electric codes.

Ground all non-current carrying metal parts to guard against electrical shock.

With the exception of motor overload protection, electrical disconnects and over current protection are not supplied with the equipment.

Introduction to the Control

Description of Control Front Panel

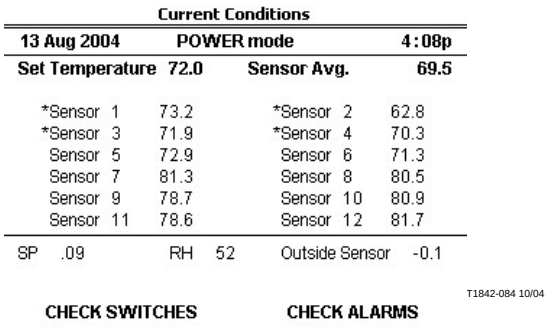


Item	Description
1	Chore-Tronics® 2 (Beeder Edition) Front Panel
2	Display Screen
3	Subject Buttons
4	Navigation Keys
5	Edit Buttons
6	Enter Key
7	Alphanumeric Keypad
8	Index Keys

Figure 1. Description of Front Panel

Display Screen

The display screen is a ¼ VGA display. This screen will display the requested information when a Subject Button is pressed. The display screen always remains lit. When the control is left dormant the Current Conditions screen will be visible. When assigned relay switches are not in the automatic position, or an alarm condition is occurring, the CHECK SWITCHES or CHECK ALARMS indication appears, flashing at the bottom of the screen. **(See Figure 2 Below)**


Current Conditions
13 Aug 2004 POWER mode 4:08p
Set Temperature 72.0 Sensor Avg. 69.5
*Sensor 1 73.2 *Sensor 2 62.8
*Sensor 3 71.9 *Sensor 4 70.3
Sensor 5 72.9 Sensor 6 71.3
Sensor 7 81.3 Sensor 8 80.5
Sensor 9 78.7 Sensor 10 80.9
Sensor 11 78.6 Sensor 12 81.7
SP .09 RH 52 Outside Sensor -0.1
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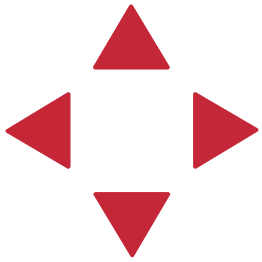
CHECK SWITCHES
CHECK ALARMS

Figure 2. Display Screen

Navigation Keys

Navigation Buttons

These buttons allow you to scroll up and down in long screens. Continuously pressing the up or down arrow button increases the scrolling speed. When you are in the *Edit Mode* the left and right arrow keys move the cursor to editable (changeable) positions. The cursor highlights the areas that can be changed.



Edit Buttons

When the button labeled **EDIT** is pressed and you are looking at a screen that has editable fields, the cursor appears. With the *Navigation Buttons*, you can move the cursor to the parameter on the screen that you want to edit. By pressing the “+” or “–” buttons, the numerical values are changed. If you are changing text (i.e. “yes” or “no”), the "+" and "–" keys scroll through the possible text choices. Pressing the **EDIT** button a second time exits the edit mode.

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Enter Key

The Enter is used to accept changes made in editable fields. Press Enter key after a desired change is made to save the change. Alternatively changes can also be accepted by pressing the down navigation button or by pressing the Edit key and exiting the edit mode.

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Alphanumeric Keypad

The Alphanumeric Keypad is used to enter a number directly into a field without having to scroll to the number. To directly enter a number, press the Edit Key and highlight the desired field to be changed. Next type in the desired value of the field and either press the Enter Key or press the down navigation arrow. The new value should now be in place.

1) Press the Edit Key and highlight the number you want to change.

2) Press the desired number on the Alphanumeric Keyboard.

3) Push the Enter Key or the down Navigation Arrow.

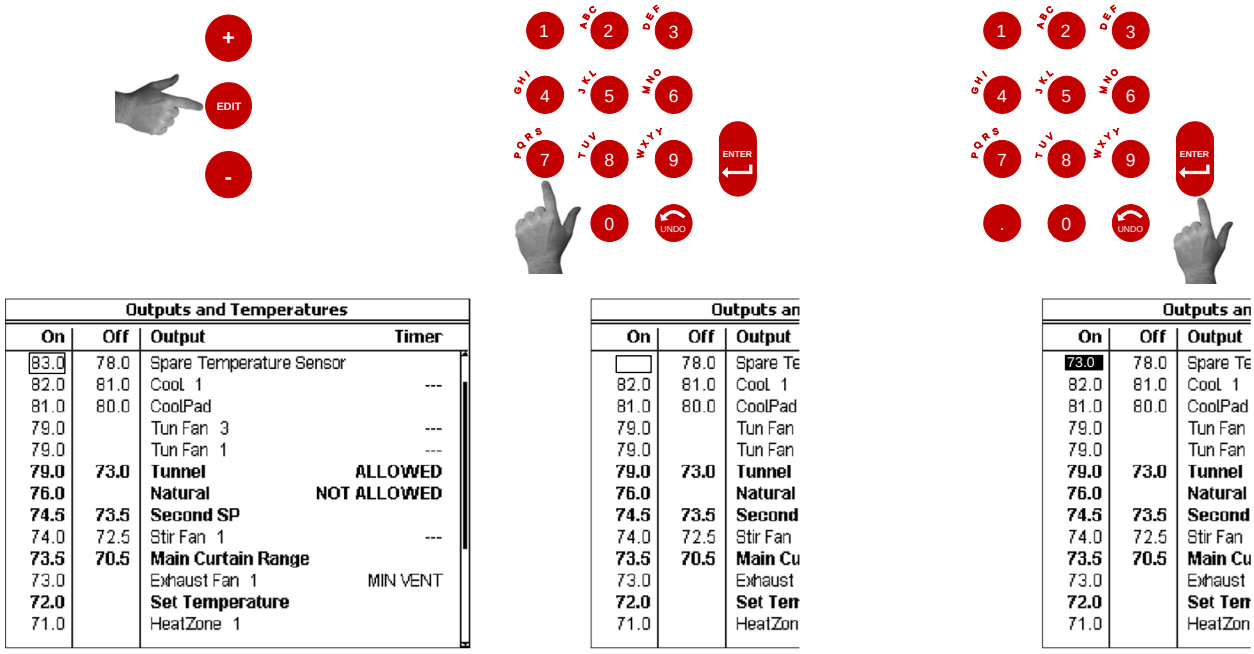
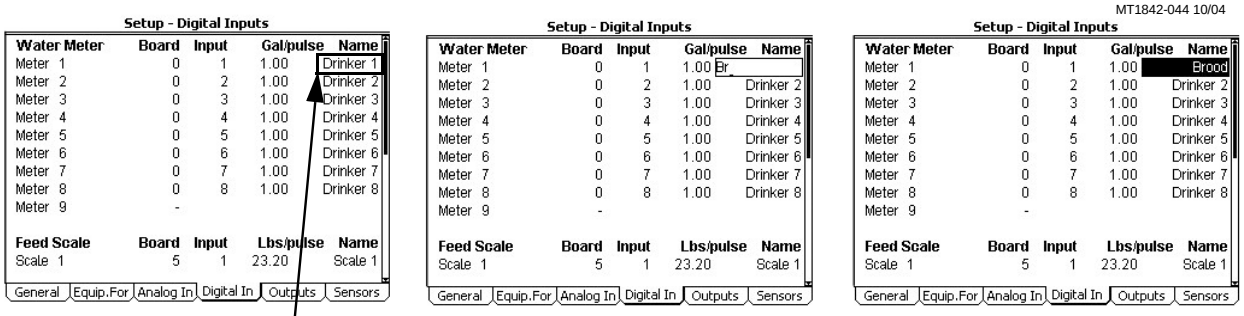


Figure 3. Alphanumeric Keypad

The Alphanumeric Keypad can also be used to change the name of some text fields. To change a text field name press the Edit Key and highlight the desired field to be changed. (In the example below, Drinker 1 is highlighted). Next, enter the new letters into the text field by pressing the appropriate number on the Key Pad. (In the example below we are changing it to read Brood). The first letter above each Key is chosen by pushing that Key once. To choose the second letter above each Key, push that Key twice. In our example the letter B is chosen by pressing the #2 button two times in a row. The letter R is chosen by pressing the #7 button three times in a row. Allow a pause of 1-2 seconds in between letters.


Setup - Digital Inputs
Water Meter Board Input Gal/pulse Name
Meter 1 0 1 1.00 Drinker 1
Meter 2 0 2 1.00 Drinker 2
Meter 3 0 3 1.00 Drinker 3
Meter 4 0 4 1.00 Drinker 4
Meter 5 0 5 1.00 Drinker 5
Meter 6 0 6 1.00 Drinker 6
Meter 7 0 7 1.00 Drinker 7
Meter 8 0 8 1.00 Drinker 8
Meter 9 -
Feed Scale Board Input Lbs/pulse Name
Scale 1 5 1 23.20 Scale 1
General Equip.For Analog In Digital In Outputs Sensors
Select Drinker 1
Setup - Digital Inputs
Meter 1 0 1 1.00 Br
Drinker 2
Drinker 3
Drinker 4
Drinker 5
Drinker 6
Drinker 7
Drinker 8
Scale 1 5 1 23.20 Scale 1
General Equip.For Analog In Digital In Outputs Sensors
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Setup - Digital Inputs
Meter 1 0 1 1.00 Brood
Drinker 2
Drinker 3
Drinker 4
Drinker 5
Drinker 6
Drinker 7
Drinker 8
Scale 1 5 1 23.20 Scale 1
General Equip.For Analog In Digital In Outputs Sensors

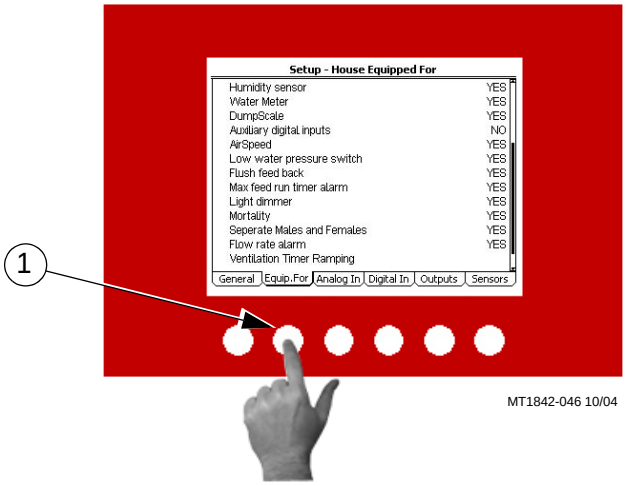
Enter new letters into the field by pressing the appropriate numbers on the keypad.

Drinker 1 has been successfully changed to "Brood".

Figure 4. Changing Text Fields

Tab Keys

There are six Tab Keys across the bottom of the display. The Tab Keys allow access to different screens within a given Subject Key. The name of each screen will appear at the bottom of the display above the Tab Key. To select a screen, press the Tab Key that is directly below the name of the desired screen. In **Figure 5 below**, the Tab Key that is under "Equip. For" has been pressed, accessing the "Equip. For" screen.

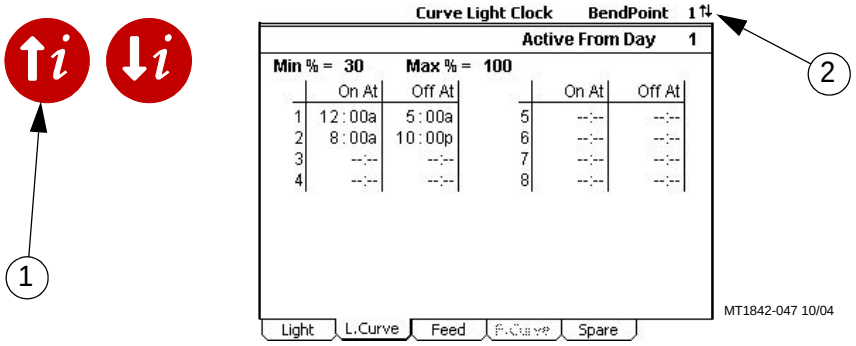


Item	Description
1	Tab Key

Figure 5. Tab Keys

Index Keys

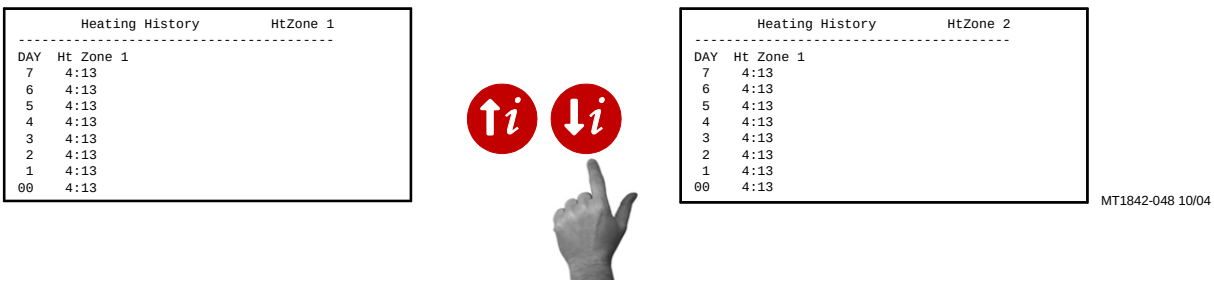
The Index keys are used to scroll through the Feed Clock Curve and the Light Clock Curve bend points and to scroll through certain lists such as heat zone runtimes in the History-Environment screen. An arrow(s) will appear whenever the Index Keys can be used to quickly scroll through lists or bend points. In **Figure 6 below**, there is an example of using the Index Keys to scroll from HtZone 1 to HtZone 2.]



Item	Description
1	Index Keys
2	Index Key Arrows

Figure 6. Index Keys

Example: To change from HtZone 1 to HtZone 2, push the Down *Index Key*.



Fast Edit

While editing a number on the screen, you will notice that the digit you are changing is underlined. For example: (72.0). If you wish you can move to different digits of the number in order to change the number more rapidly. To do this **See Figure 7 below.** Fast Edit is very useful when making large changes to numbers.

Action	Result
Press the Edit button	72.0
Press "+" followed by "-"	72.0
Within 3 seconds, Press the Left arrow twice	72.0
Press "+" twice arrow	92.0

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Figure 7. Fast Edit.

Security

To provide for security in setting your Controls, there is a security feature that appears when you press the *Edit* button. The Control automatically asks for an access code at that time, The access code is a four digit number that you have selected while setting up the Control and is explained under the "**Changing the Access Code**" section of this manual. Once you have inserted the correct code, the Control allows you to make changes. If five minutes pass since your last change, the access code has to be re-entered.

Subject Buttons

On the front of the Control are 14 subject keys. As each Subject Button is pressed, the light beside that button turns on and the subject that is described beside the button appears on the screen. If no other buttons are pressed for 5 minutes, the Control automatically returns to the *Current Conditions screen.*

Alarm Indicator (LED)

The Indicator Light (LED) next to the number 8 Subject Button indicates the current status of the Alarm. The Alarm Status's are as follows...

1. Solid Green- All is normal (No Alarm)
2. Flashing Green- Warning, un-noticed alarm, or temporary off alarm
3. Flashing Red- Active Alarm

How to Maneuver in the Viewing Screen

- The procedures below give a brief overview on the use of the *Navigation Buttons* and the *Edit Buttons.*
- Screen 13, Setup-General is used for this example.

Using the Navigation Buttons

1. Press BUTTON 13. **Figure 8** appears in the display.

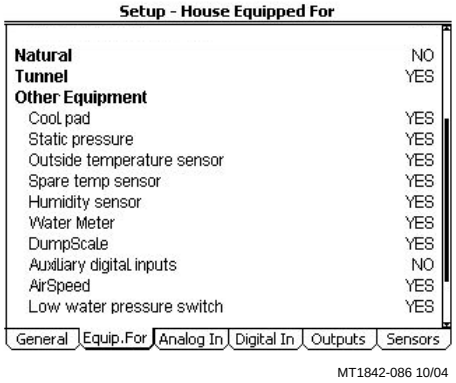

Figure 8. Navigation Buttons.

2. Press the **DOWN ARROW** once.
   The view shown on the screen will scroll down one line as shown in **Figure 9.** If you push the **UP ARROW** once the text scrolls back to where it was.

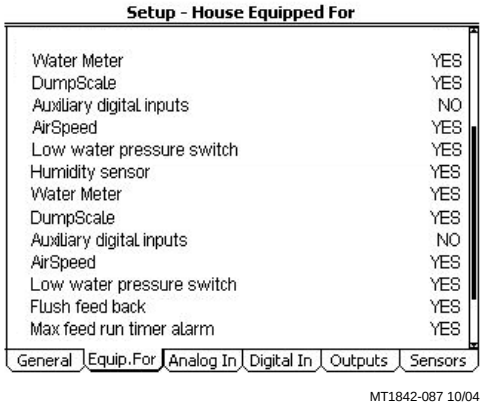

Figure 9. Navigation Buttons-Down Arrow.

3. The left and right arrow keys are used during the Edit Mode.

Using the Edit Buttons

The Edit Mode is entered by pressing the Edit Button. Pressing the Edit Button a second time exits the Edit Mode.

1. Press **BUTTON 13**.
   The *Setup-General* screen appears **(Figure 10).**

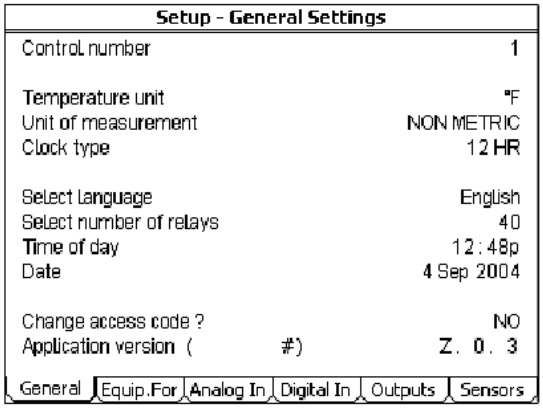

Figure 10. Setup Screen.

2. Press the **EDIT** button.
   This activates the cursor which allows settings to be edited. **Figure 11** shows what the cursor looks like. If the Control asks you for an "Access Code", enter it at this time. See the Screen 13 "General Tab" section of this manual for details on how to use access code.

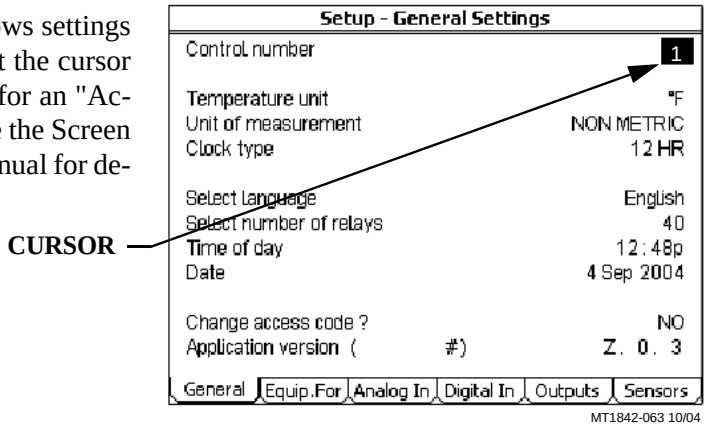

Figure 11. Setup-General Screen in Edit Mode.

3. Press the (+) or (–) buttons to edit the House #. The (+) key increases the value and the (–) key decreases the value.

4. Press the **DOWN ARROW (Figure 12).**

5. Press the (+) or (–) buttons to change from Fahrenheit to Celsius.
   In this case the (+) and (–) buttons select different text choices.

6. If two or more editable settings are on the same line, the *left* and *right* arrow buttons are used to move between those positions.

   When a value or text is edited, it is saved in the memory within a few seconds. If you make a mistake, change it to what you really want.

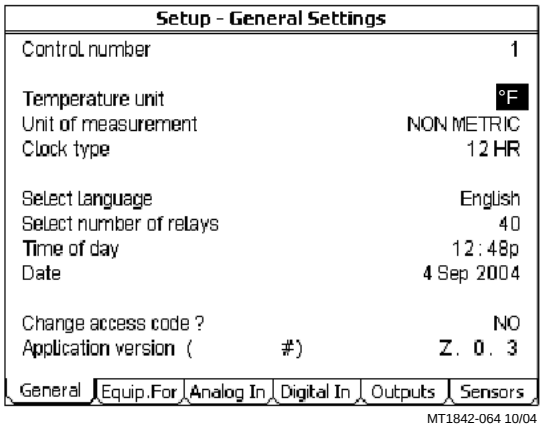

Figure 12. Press the Down Arrow.

Entering Time and Date using the Numeric Keypad

You can enter the current Time and Date using the Numeric Keypad.

1. Press **BUTTON 13**.
   The *Setup-General* screen appears **(Figure 13).**

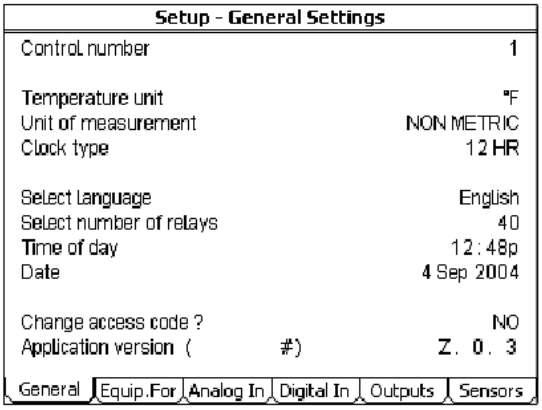

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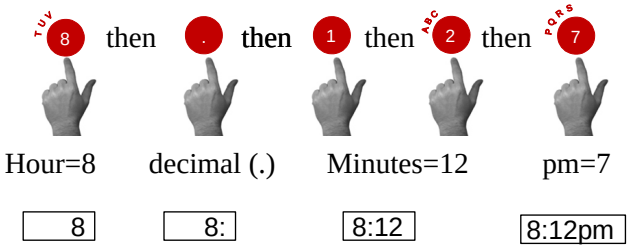
Figure 13. Setup General Screen.

2. Press the **EDIT** button and use down arrow to highlight the Time of day **(Figure 14)**. Using the Numeric Keypad, enter in the correct hour followed by the decimal key (.). Enter the correct minutes followed by either; am or pm (Use the number 2 on the Keypad for **am**, or the number 7 for **pm**). *The example below* is setting the time to 8:12 pm.



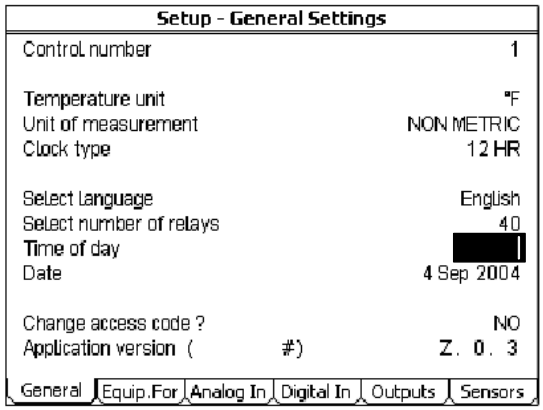


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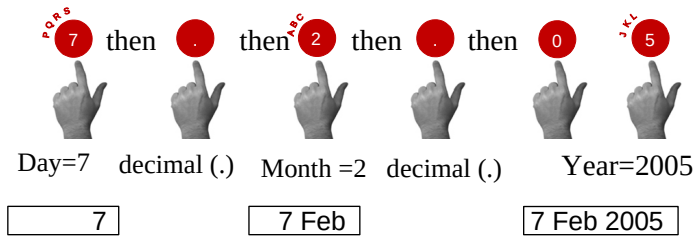
Figure 14. Changing Time of Day.

2. Press the **EDIT** button and use down arrow to highlight the Date **(Figure 15)**. Using the Numeric Keypad, enter in the correct day, followed by the decimal key (.). Then enter the correct month, followed by the decimal key (.). Finally, enter the correct year. *The example below* is setting the date to February 7th, 2005.



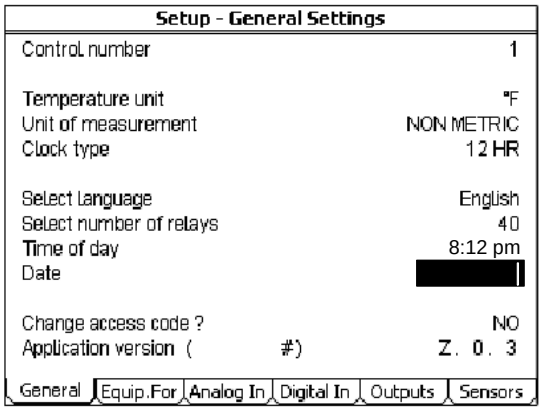


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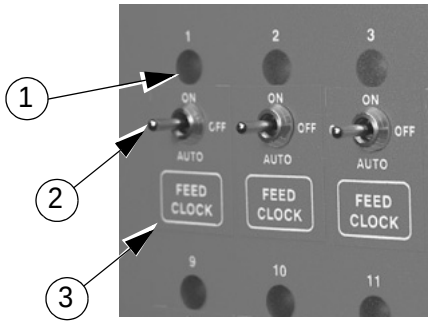
Figure 15. Changing the Date.

Use the same procedure to set "Start" and "Stop" times in any of the Clock Screens.

Relay Box Indication Lights and Auto/Manual Switches

Each Relay Output has its own three position switch that allows the user to select manual, off or automatic control of each Relay. The Relays and their corresponding Switches are located in a separate box. Decals are supplied to label each Switch for the Output function that is assigned to that Switch. The Switches can be placed in three positions - "on", "off", or "auto". The "auto" position is for normal automatic operation. Changing a Switch to "on" or "off" overrides "auto" operations. When a switch that is assigned is placed in a position other than "auto", a message will appear in the Current Conditions screen advising you to "Check Switches". The light above each Switch indicates that the Switch's Relay is activated.



Item	Description
1	Indication Light
2	Switch
3	Decal

Figure 16. Indication Lights and Switches

Glossary of Terms

Analog Input

Analog Inputs can consist of the following:

1. Temperature sensors
2. Static Pressure sensor (0-10 volts)
3. Relative Humidity Sensor (0-10 volts)
4. Potentiometer (Natural Ventilation)

Anticipation

When the control is turning on the fans assigned to the Minimum Ventilation Timer, the control will open the inlets to the correct position for static pressure control before the fans are turned on. If calculated anticipation is used (default), the control teaches itself how much adjustment was required during the previous on-off cycle, and uses that amount of "anticipation" for the next cycle. If the optional fixed anticipation is used, the control will NOT teach itself what the correct anticipation should be. It uses the amount of "anticipation" that is entered in the Static Pressure screen (Screen 11). Anticipation will occur when the fans assigned to the Minimum Ventilation Timer turn on due to the timer reaches an ON cycle or the sensor(s) assigned to the fans reach the fans' ON temperature.

Back Up Relay Output

The backup up relay output is a relay that will be energized as soon as the backup output is assigned to a relay. This relay will stay energized as long as the control is communicating with the manual switch board where the output is assigned. The 24 Vdc signal that comes from the control to the back up box should be routed through this relay. If communication is lost between the main box and the manual switch board, the relay will drop out allowing the first fan stage in the back up box to turn on. See the Wiring Diagrams section of this manual for more wiring information.

Bend Point (BP)

The Bend Points (BPs) are simply the points on the curve that define the curve. For the Set Temperature and Minimum Ventilation Timer curves, the curve values are gradually changed between bend points. The bend point values are the exact values at midnight beginning the day # of each bend point. The curve takes over when you turn the curve "on" and the day number is equal to or greater than the day number assigned to BP #1.

Cool Pad Output

The COOL PAD Output is a special function for controlling evaporative cooling that allows you to modulate the addition of water to the cooling pad in such a way that the usual large temperature swings associated with a cooling pad are avoided.

Curve

A "curve" is a listing of up to 10 points in time (bend points) that defines how you want a parameter to automatically vary as the animals age.

Curve Value

The Control will list what the current value(s) the curve would be, if the current day number is greater than the day # of bend point #1, and the curve is "on", and there is no "offset" to the curve.

Day Number

The intention is that the day # is the age of the animals whose environment is being controlled. Day # 0 does not exist. Negative days (down to - 7) are allowed. Changing the day # in any screen that shows the day number, will change the day # in all the other screens that show the day #.

Digital Input

Digital Inputs can consist of the following:

1. Water meter
2. Feed scale
3. Air speed sensor
4. Low water pressure switch
5. Max feed run time Input
6. PDS flush feed back

Event

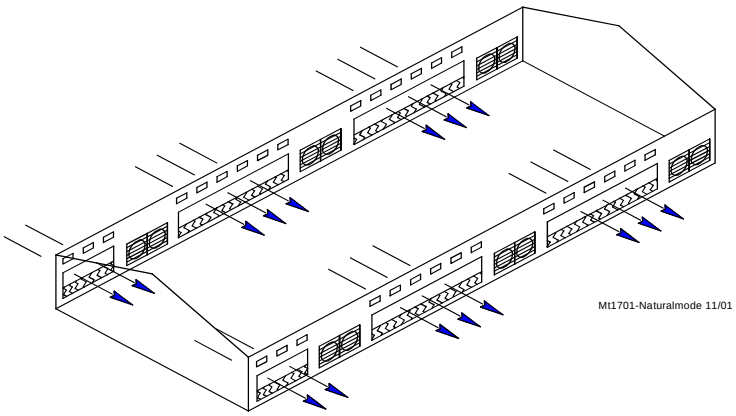
This term applies to the time clock Outputs. An "event" is an "on at" time combined with an "off at" time.

Mode Sensor(s)

The concept of Mode Sensor(s) is essential to the understanding what makes the Control change from one mode to another. The Mode Sensor(s), of a currently operating mode, determines when the Control will leave that mode. As an example, while in the Power Mode, the Power Mode Sensor(s) determines when it's too hot to stay in the Power Mode (i.e. above the tunnel "on" temperature). Because of this, it converts to the Tunnel Mode (assuming there is no Natural Mode) at the tunnel "on" temperature. It comes back to the Power Mode from the Tunnel Mode, when the Tunnel Mode Sensor(s) say it's too cold to stay in the Tunnel Mode (i.e. below the tunnel "off" temperature).

Natural Mode

Natural Mode requires the house to be equipped with Curtains in the side walls that are powered by Drive Units (Curtain Machines). The Control converts to this mode of operation when the temperature(s) inside the house raise to a level that the Fans of the Power Mode can't keep the temperature(s) under control. While in the Natural Mode of operation, the Curtains are opened or closed, as required, to control the temperature(s). This mode of operation generally happens during moderate weather.



Noticing an Alarm

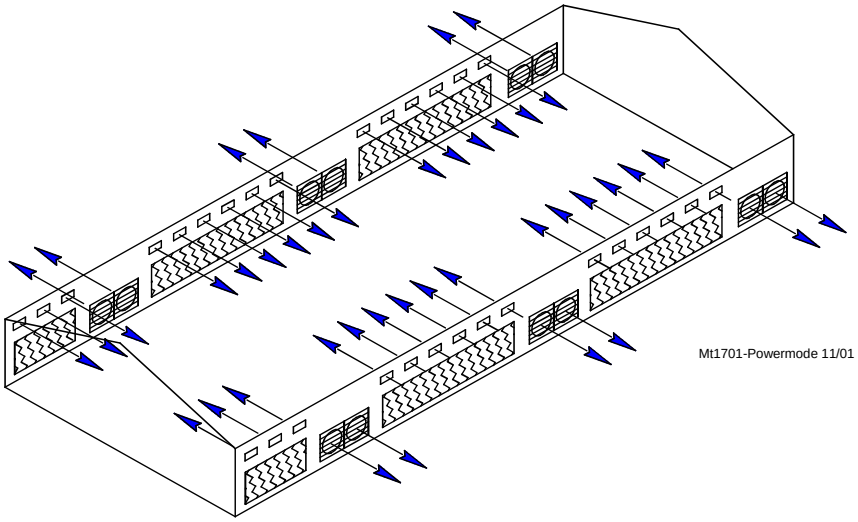
"Noticing" an alarm is a very important part of using the alarm system. By pressing the alarm button, you can tell the Control that you have "seen" the alarm message. The first press of the alarm button "notices" the alarm message at the top of the alarm screen. Each additional press of the alarm button "clears" the first alarm and "notices" any additional alarm(s), one at a time.

Offset

The term "offset" applies to the Set Temperature and Minimum Ventilation Timer curves only. If you manually adjust either the Set Temperature or the Minimum Ventilation Timer settings, while the curve is on, you create an "offset" to that curve relative to it's "curve value". The "curve value" is not changed. (see the "curve value" definition above.) The curve value is shown as a convenience so that you know what you have to change it back to in order to get back on the actual curve's table listing. While an "offset" is in effect, the parameter of the curve is still modified versus time. However, the actual parameter value is the "curve value" modified by the "offset".

Power Mode

The building is closed up except for Inlets (usually Baffle Doors) which are powered open and close in order to control the static pressure level. In some cases Gravity Inlets are used where the static pressure is not controlled directly. The only ventilation provided is due to Fans mounted in the end or side walls. This mode of operation generally happens when the outside temperatures are somewhat lower than the set temperature.



Program

A "program" is a complete set up of all the screens of a Control. In the main menu Program Tab, six different "programs" can be saved and later activated. This can be very convenient when it is desired to change the set up at different points during the grow out, barn cycle, or times of the year.

Set Temperature

The set temperature is another very important, basic, concept. All temperatures are referenced to the set temperature. When the set temperature is adjusted either manually, or because the set temperature curve is on, all other temperature settings move up or down by the same amount. For instance, even though you program an actual temperature for each Fan to come on and off, when you change the set temperature, those Fan's on and off temperatures are adjusted by the same amount
you changed the set temperature.

Spare Temp Sensor

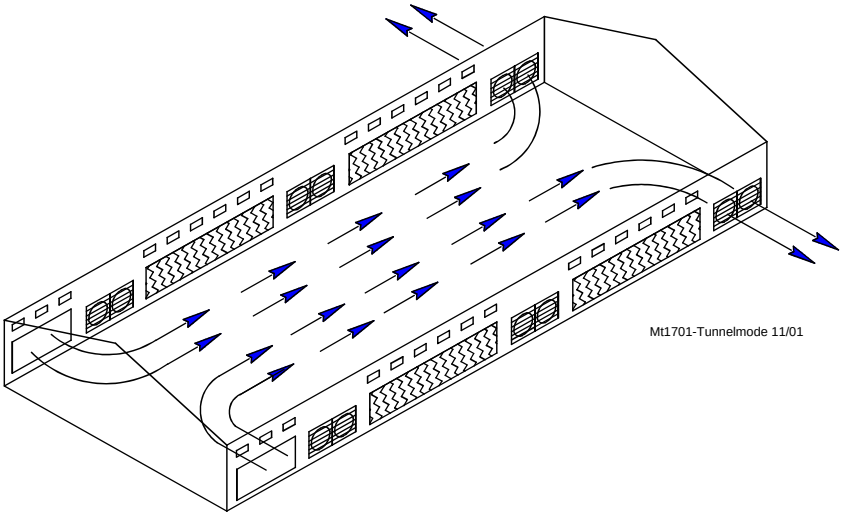
The spare temperature sensor is a temperature sensor that is separate from one of the 12 controlling sensors. This sensor can be used to control the temperature in a separate area of the house. The sensor has its own maximum and minimum alarm parameters that can be set up in the Alarms screen. The sensor can also turn on and off the Spare Temperature Sensor Output. This output functions like a fan output. The output has lower Off temperature than its On temperature. The On and Off temperatures for the Spare Temperature Sensor output are defined in the Outputs and Temperatures screen. The spare temperature sensor can not be used to control any other output.

Static Pressure

Static pressure refers to the pressure difference that exists between the inside of the house and the outside of the house. This pressure difference is the result of Fans in the walls running. The air that they exhaust enters the house through various types of air inlet openings. In the Power Mode the typical powered baffle inlets is where the vast majority of the air enters. In the Tunnel Mode, the tunnel inlet at the end of the house is where the air enters. The pressure drop, due to the resistance to the air flowing through the inlets, is the reason a static pressure difference exists. If the inlets are all the same size, the same amount of air will enter through each inlet. In the Natural Mode of operation, the outside wind is the source of the air, with no exhaust fans running. In general there is little or no static pressure during the Natural Mode due to the huge area of the open side wall curtains. When the incoming air is cooler than the inside air, it will tend to drop down onto the birds before it is warmed up. Adequate static pressure brings the air into the house high and fast so that it heats up before it can fall.

Tunnel Mode

This mode of operation requires a group of large fans at one end of the house with a large air Inlet area at the opposite end of the house. The control converts to this mode of operation from the Power or Natural Mode (if used), when the temperature(s) while in those modes get too high. The typical 5 or 6 mph. breeze, which can be created by the Tunnel Fans running, produces a wind chill effect that is significant. This mode of operation happens during warm to hot weather.



Wind Delay

The static pressure has to be out of the control limits continuously for the "wind delay" amount of time before the inlets are adjusted. If a fan or fans has turned on or off within the last 10 seconds, the wind delay does not happen and the inlets respond as soon as the static pressure leaves the control limits.

Dump Scale

Compartment type of scale that sends pulse every time on of the compartments "dump". This scale can provide direct feedback to the control as to how much feed has gone through the scale.

Mechanical Scale

Balance beam type scale system where a weigh bin sits on top of the balance beam structure. Dry contact switches provide feedback to inform the control when the weigh bin is empty or full, but not the exact amount of feed. The amount of feed fed must be entered manually by the user (if desired).

Preset

The desired amount of feed to be fed into the breeder or pullet house. Once the desired amount of feed has been delivered to the house, the preset must be "reset"(either manually or automatically) back to 0 so that the feeding cycle can be repeated on the next feeding day.

Overview of Screens

Screen 1: Current Conditions

Screen 1, **(Figure 17)** shows a brief summary of the current conditions of the house. There are no editable values in this screen; it is for viewing only.

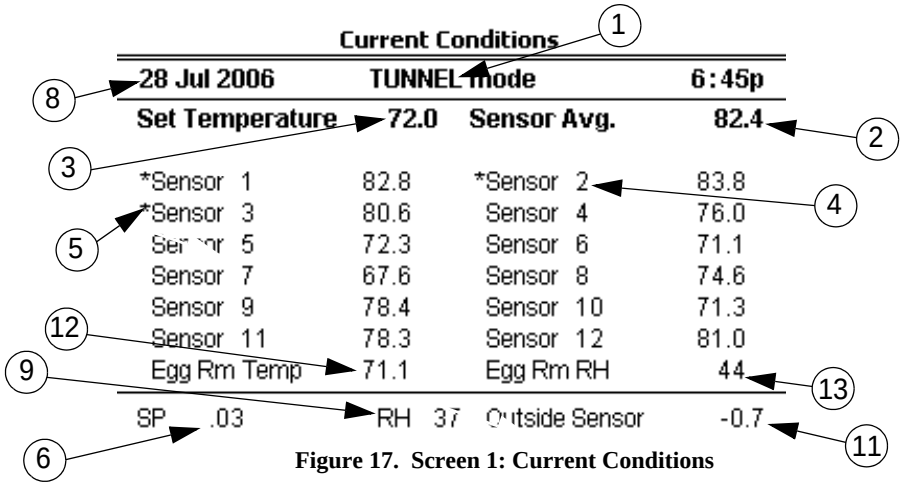


Figure 17. Screen 1: Current Conditions

1. Operating Mode - this indicates the mode of the current Control. The three possible modes are Power, Natural, and Tunnel.
2. Control Temperature - this is the reading of the current Mode Sensor (or Sensors). The Sensor or Sensor(s) that make up the Mode Sensor is indicated by an (*) in the list of Sensors. The current mode sensor determines when the Control changes to a different mode.
3. Set Temperature - this is the temperature you want to achieve in your house through the use of heating, cooling, and ventilation.
4. Sensors - each Sensor that is being used in the house will show a current temperature. If a Sensor is not used, the area will be blank. If a Sensor is out of range, it will be indicated by “#” in place of a temperature.
5. (*) - this indicates that this Sensor is a Mode Sensor for the current mode. If more than one (*) appears, the Mode Sensor(s) temperature will be the average of those Sensors.
6. Static Pressure - indicates the current static pressure in the house. If static pressure is not being used this area will be blank. If there is a reading that is out of range, it will be indicated by “#” in place of a static pressure reading.
7. Check Switches - this will appear (flashing) if any of the manual switches are in a position other than “auto”, except for any switches that are not used. It can be DANGEROUS to operate with switches in the "Off" Position.
8. Time and Date - shows the current time and date.
9. House RH - indicates the current relative humidity in the house. If relative humidity is not being used this area will be blank.
10. Check Alarms - this will appear (flashing) if the Control detects an alarm condition. This will continue to appear until the condition is corrected.
11. Outside Sensor - This is where the outside Sensor reading is displayed if the outside Sensor choice is set up in screen 13.
12. Egg Room Temp- Current egg room temperature.
13. Egg Room Humidity- Current egg room humidity.

Screen 2: Auxiliary Data

To view the Auxiliary Data Screen, push the "Auxiliary Data" subject button. (Button 2)

(Auxiliary Data Screen) General Tab

To access the Auxiliary Data "General" screen, press one of the Tab Keys under "General".

1. Cool Pad Output Status-This indicates the Cool Pad function's current amount of water on time. If the value of the number is 0 then the Cool Pad function is currently not operating. If the word BLOCKED appears then the Cool Pad function is currently being blocked from operation by the relative humidity sensor.
2. Air Speed-The current air speed in the house is displayed here. If the air speed is less than 125 feet/min (.63 m/s) then the word LOW will be displayed as the airspeed.
3. Light Dimmer Output percentage-The current actual light dimmer level percentage is shown here. Values can range from 0-100%.
4. Spare Temperature Sensor-The current reading of the spare temperature sensor is displayed here. The spare temperature sensor can be assigned to a spare output and can have its own maximum and minimum alarm setting separate from the controlling temperature sensors.
5. Today's Water usage-The current water usage for today since midnight for each drinker Water Meter connected to the control is displayed here.
6. Today's Feed usage-The current feed usage for today since midnight for each feed scale connected to the control is displayed here.
7. Today's Auxiliary digital input usage-The current reading of each auxiliary digital input (non-drinker Water Meters, electric meters, gas meters, etc.) is displayed here. Each auxiliary Input can be given a unique name using the alphanumeric key in the Setup-General Screen.
8. Bird Age-Current age of the birds in days. The number in parentheses indicates the age of the bird in weeks and days. For example: if the birds are 38 days old the number in the parentheses will show 5.3 (5 weeks and 3 days).

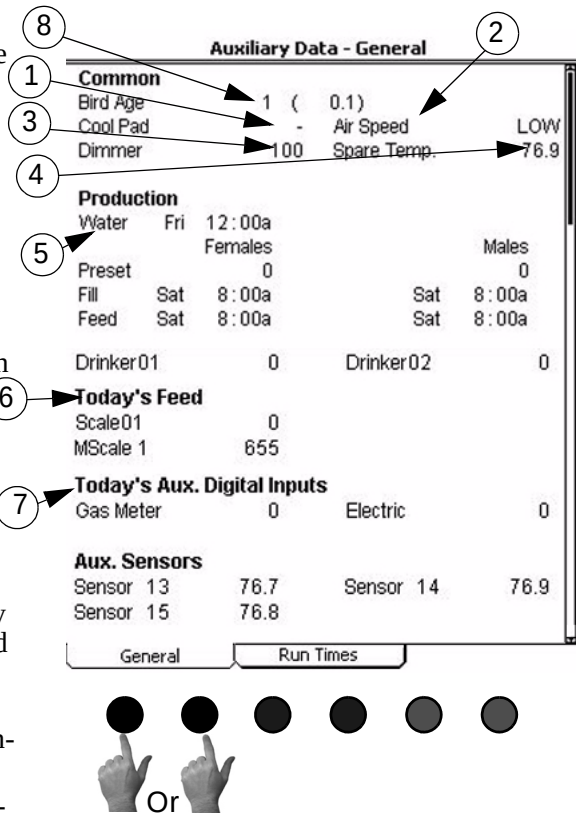


Figure 18. Auxiliary Data: General Tab

(Auxiliary Data Screen) Run Times Tab

To view the Auxiliary Data "Run Times" screen, press one of the Tab Keys under "Run Times". The Auxiliary Data: Runtimes screen displays the current runtime since midnight (in hours and minutes) for all Heat zones, Exhaust Fans, Stir Fans, Tunnel Fans, and the Cool and Cool Pad Outputs that have a relay assigned to them.

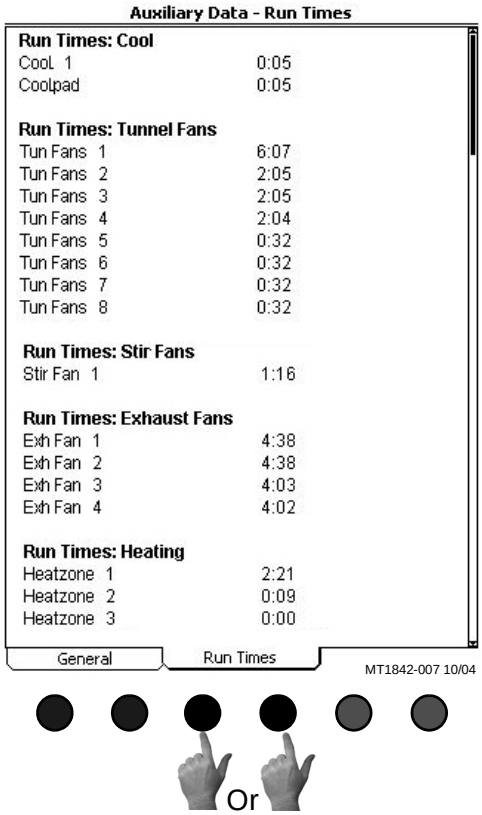


Figure 19. Auxiliary Data: Run Times Tab

Screen 3: Set Temp/Min Timer

To view the Set Temp/Min Timer screen, press the Set Temp/Min Timer Subject Button. (Button 3)

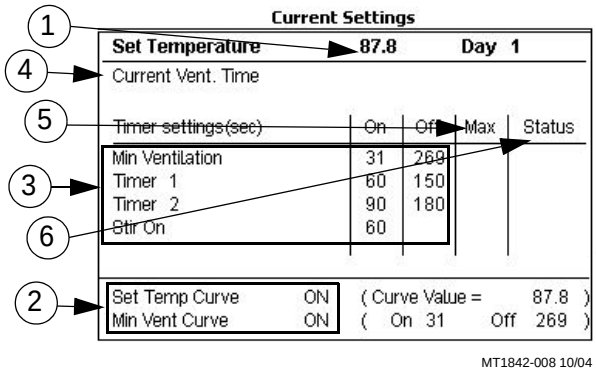


Figure 20. Screen 3: Set Temp/Min Timer

1. The “set temperature” is a very important parameter. All other temperatures are keyed to the set temperature. When the set temperature is changed, all other temperature settings are also changed by the same amount to maintain the same temperature differences relative to the set temperature.
2. The Temp Curve and Min Vent Curve “on” indications are not editable. They only indicate that the curve(s) are “on” and the curve’s value. If a curve is not “on”, there is no indication in this area. The values shown in the parentheses are the current curve’s values. If the actual values are different, the difference represents the “offset”. Editing the actual values to be the same as the values shown between the parentheses will erase the offset(s). An "offset" is caused if you change a value when its curve is on.
3. The Minimum Ventilation Timer can be attached to Exh Fan, Tun Fan, and Stir Fan Outputs in the "Outputs" screen. The “on” and “off” times for this Timer are set up here in the (Set Temp) "Current Settings" screen. The Timer turns the Fan on or off when the temperature is below the Fan’s "on" temperature. A Timer can only be attached to a Tun Fan Output if the "on" temperature setting of the Tunnel Fan is set lower than the “on” temperature of the Tunnel Mode. Allowable “on” times for this Timer are 0 or greater than 30 seconds (5 through 29 seconds is only allowed if fixed Anticipation is used). Allowable “off” times for this Timer are 0 or greater than 60 seconds (1 through 59 seconds is not allowed). The “on” and “off” times cannot both be set at 0.
4. Current Vent. Time-The current amount of ON time the fans assigned to the Minimum Ventilation Timer will run while cycling on the timer.
5. Max Ventilation On Time-The maximum amount of ON time the fans assigned to the Minimum Ventilation timer can run before reaching the fans' ON temperature. The maximum allowed value for the Max Ventilation On Time is the amount of ON time (seconds) + the amount of OFF time(seconds) of the Min Vent timer - 60 (seconds).
6. Status-The status column shows the current status of each of the timer. If the Status is ON then the timer is active and the Output(s) currently assigned to that timer should be running. If the Status is OFF, then the timer is active, but the Output(s) assigned to that timer should NOT be running. If the Status is "-" or "tmp", then the timer is not currently active and the Output(s) assigned to that timer may or may not be running (depends on the type of Output due to temperature). If there is a NA (not active) in the Status column then the timer is not assigned to any Outputs and will not be active.

Timers 1 and 2 can be attached to Cool, Tun Fan, Exh Fan, and Stir Fan Outputs in the "Outputs" screen. The “on” and “off” times for these Timers are set in this screen. These Timers behave like the minimum ventilation Timer except when they are attached to a Cool Output. When attached to a Cool Output, the timer has no effect until the Cool Output is “on” due to it’s temperature settings. At that point the Cool Output goes on and off with the Timer. The Cool Output never comes on continuously when Timer 1 or Timer 2 is attached to it. There are no limitations to the “on” and “off” settings for Timer 1 and Timer 2 except that the “on” time and “off” time cannot both be set at 0.

The “stir on” Timer is different than the other Timers. It can only be attached to Stir Fan Outputs in the "Outputs" screen. The “stir on” time value is set in this screen. The purpose of this feature is to allow you to cause a Stir Fan Output to run for the “stir on” amount of time immediately following the end of the Minimum Ventilation Timer’s “on” time. Because of this, the Stir Fan is synchronized with the minimum ventilation Timer. The "stir on" setting can be any value up to the “off” time of the minimum ventilation Timer. The Stir Fan Outputs will come on full when the temperature rises to the "on" temperature value set in the "Outputs" screen.

Ventilation timer ramping-Ventilation timer ramping needs to be set to YES in Setup General: House equipped for screen (Screen 13, equipped tab). If the sensor(s) that are assigned to the Minimum Ventilation fan(s) temperature is at or below set temperature then the fans will use the ON and OFF times that are listed for the Minimum Ventilation Timer. If the sensor (s) assigned to the Ventilation Time Ramping temperature is between set temperature and the fans' ON temperature the control will adjust the amount of ON time between the Min Ventilation value and the Max value. The OFF time will be adjusted by the same amount of time that the ON is adjusted, thus keeping the total cycle time constant. The temperature is checked 30 seconds before the beginning of the ON time cycle of the Minimum Ventilation Timer. Once the fans' temperature sensor(s) reach the fans' ON temperature, the fan will turn on and run continuously until the fans' OFF temperature is reached.

Example: The set temperature is 70.0°F and the fans assigned to the Min Vent timer ON temperature is 72.0°F. The Minimum Ventilation Timer values are 30 seconds ON time and 270 seconds OFF time. The maximum ON time is 210 seconds. If the sensor(s) assigned to the Ventilation Time Ramping temperature is 71.0°F at the beginning of the anticipation cycle, then the fans will have an ON time of 125 seconds and an OFF time of 175 seconds.

Screen 4: Outputs-Temperatures

Screen 4, **(Figure 21)** is a very important screen. It is the screen that determines at what temperatures Outputs operate. An important tip regarding the use of this screen is to get in the habit of asking yourself which Temperature Sensor (or combination of Temperature Sensors) is assigned to the various Outputs shown on this screen. For instance, in **Figure 21 below**, Exh Fans 3 and 4 are set to come "on" and "off" at the same temperatures, they may not go "on" and "off" together if they are assigned to different Sensors in screen 13.

(Outputs and Temperatures Screen) House Tab

To access the "Outputs and Temperatures House" Screen, press the Tab Key under "House"

1. This column lists the "on" temperatures of the outputs listed in column 3. For outputs above the set temperature, the output goes from "off" to "on" with rising temperature. For the Heat Zone Outputs, below the set temperature, they go from "off" to "on" with falling temperature. After changing any temperatures in the "on" column, the screen will re-sort itself according to the "on" temperatures the next time you select this screen.
2. This column lists the "off" temperatures of the outputs listed in column 3. All Heat Zone output's "off" temperatures (as the temperature rises) are fixed to be 0.5 degrees above their "on" temperatures or the value specified in the OFF column for that Ht. Zone. The "on-off differentials'' of all other outputs are adjustable. For Fan outputs the "off" temperatures are either the value of the next lower Fan's "on" temperature or the value you specify in the OFF column for that output. The default "off" temperature for the lowest temperature Fan output is the set temperature if an "off" temperature is not entered. The minimum "on-off differential" allowed.

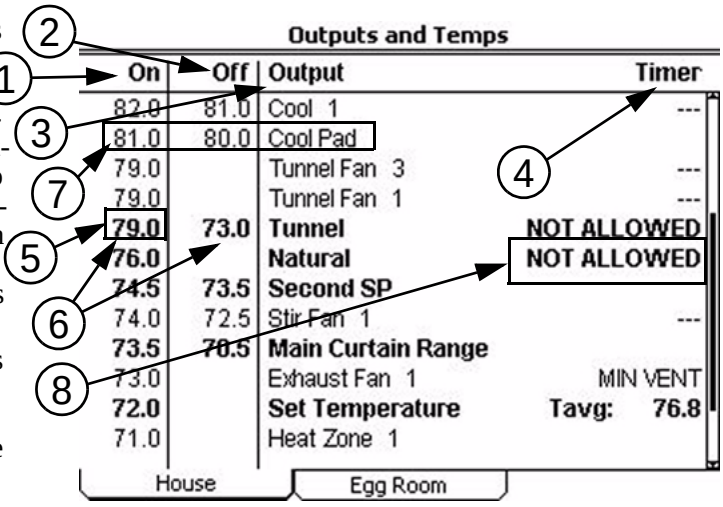


Figure 21. Screen 4: (Outputs Temperatures) House Tab

3. The Output names listed in column 3 are a result of what is programed into screen 13.
4. In column 4 you attach a Timer to those Outputs you want to be affected by a Timer. See the screen 3 description regarding how the various Timers behave and which Outputs can have which Timers attached to them.
5. This is the temperature of the Power Mode Sensor(s) where the Control will change from the Tunnel Mode to the Natural Mode.
6. The "on" and "off" temperatures of the Tunnel Mode are entered here. The Control will convert to the Tunnel Mode when the Natural (if used) or Power Mode Sensor(s) raises to the Tunnel "on" temperature. The Control will convert back to the Natural (if used) or Power Mode when the Tunnel Mode Sensor(s) reaches the "off" temperature. The minimum allowed difference between the Tunnel "on" and "off" temperature is 3 degrees F.
7. The Cool Pad Range's "on" and "off" temperatures have a very different meaning from the "on" and "off" temperatures of the other Outputs. The "on" temperature is the high limit of the desired range while the "off" temperature is the low limit of the desired range. See the "Cool Pad Function" section of this Manual for more details regarding the COOL PAD function.
8. For both the Natural and Tunnel Modes it is possible to ALLOW or NOT ALLOW the mode to occur in these fields of screen 4. Do not use the YES/NO questions in screen12 to temporarily disable either mode.

9.Tavg: The current average temperature inside the house.

(Outputs and Temperatures Screen) Egg Room Tab

To access the "Outputs and Temperatures" Egg Room Tab Screen, press the Tab Key under "Egg Room"

1. This column lists the “on” temperatures of the outputs listed in column 3. For outputs above the set temperature, the output goes from “off” to “on” with rising temperature. For the Heat Zone Outputs, below the set temperature, they go from “off” to “on” with falling temperature.
2. This column lists the “off” temperatures for the cool and heat outputs of the Egg Room only. If no off temperature is specified, then the off temperature is the set temperature of the Egg Room
3. Set Humidity-Desired target temperature of the Egg Room
4. Humidifier-Humidity level at which the Egg Room’s humidifier will turn on

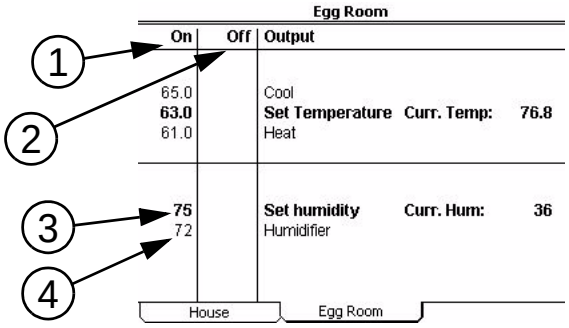


Figure 22. Screen 4: Outputs Temperatures Screen: Egg Room Tab

5. The Output names listed in column 3 are a result of what is programed into screen 13.
6. In column 4 you attach a Timer to those Outputs you want to be affected by a Timer. See the screen 3 description regarding how the various Timers behave and which Outputs can have which Timers attached to them.
7. This is the temperature of the Power Mode Sensor(s) where the Control will change from the Power Mode to the Natural Mode.
8. The “on” and “off” temperatures of the Tunnel Mode are entered here. The Control will convert to the Tunnel Mode when the Natural (if used) or Power Mode Sensor(s) raises to the Tunnel “on” temperature. The Control will convert back to the Natural (if used) or Power Mode when the Tunnel Mode Sensor(s) reaches the “off” temperature. The minimum allowed difference between the Tunnel “on” and “off” temperature is 3 degrees F.
9. The Cool Pad Range’s “on” and “off” temperatures have a very different meaning from the “on” and “off” temperatures of the other Outputs. The “on” temperature is the high limit of the desired range while the "off” temperature is the low limit of the desired range. See the "Cool Pad Function" section of this Manual for more details regarding the COOL PAD function.
10. For both the Natural and Tunnel Modes it is possible to ALLOW or NOT ALLOW the mode to occur in these fields of screen 4. Do not use the YES/NO questions in screen12 to temporarily disable either mode.

Screen 5: Clocks

The Clocks screen consists of the Current Light Clock, Light Clock Curve, Current Feed Clock, Feed Clock Curve, and Spare Clocks.

(Clocks Screen) Light Tab

To access the Clocks "Light Clock" Screen press the Tab Key under "L. Clock", if the light clock is assigned to an Output relay(s) or Light Dimmer is answered "YES". An event is defined as an ON At plus OFF At time combination for the relay(s) assigned to the light clock. The ON At and OFF At times refer to the contacts of the Output relay(s). On means the contacts are closed and Off means the contacts are open. 12:00a is midnight. If there are no Output relays assigned to the light clock and/or the Light Dimmer control is set to YES then the statement "Not Set Up" will appear in the light clock Screen.

If the light clock curve is set to ON, then the current light clock settings will not be editable. To temporarily change the current light clock settings, first set the curve to OFF, then make the desired changes. To return to the curve settings, change the curve back to ON.

1. Minimum Light Dimmer Setting-This is the minimum light level the lights will go to when the light clock reaches an OFF At time.
2. Maximum Light Dimmer Setting-This is the maximum light level the lights will go to when the light clock reaches an ON At time.
3. The light clock can also be set to control a remote light dimmer. When the control is connected to a light dimmer a Sunrise and Sunset feature is available. The amount of Sunrise or Sunset time can be set in the Setup-Controls: Other screen (Screen 14-Others Tab).
4. Sun-Use this column to choose whether or not an event will have a: sunrise only, sunrise and sunset, or no sunrise or sunset.
5. When the light clock reaches an ON At time, the control will increase the light percentage from the Min% level to the Max% level over the amount of Sunrise time. If the Sunrise time is set to 0 then the control will instantly change the light percentage from the Min% level to the Max% level at the ON At time. The Sunrise feature will occur for every ON At time of an event.
6. When the light clock reaches an OFF At time, the control will decrease the light

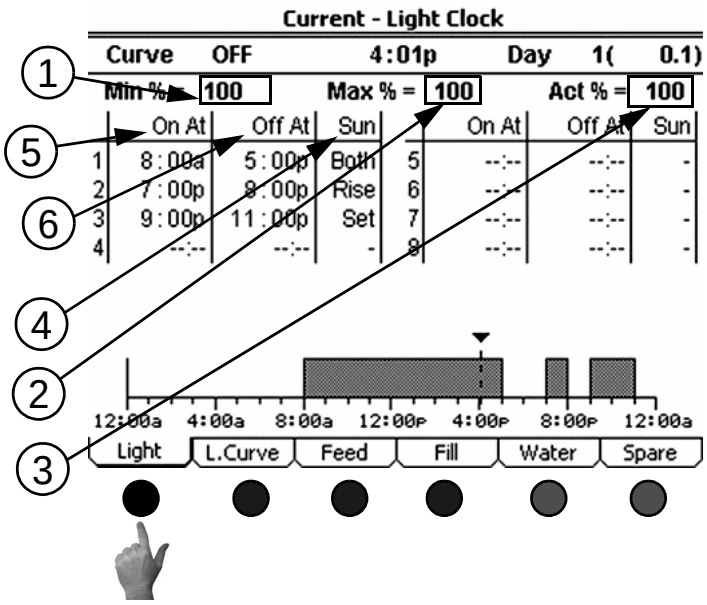

Current - Light Clock
Curve OFF 4:01p Day 1(0.1)
Min % = 100
Max % = 100
Act % = 100
On At Off At Sun On At Off At Sun
1 8:00a 5:00p Both 5 --:-- --:-- -
2 7:00p 8:00p Rise 6 --:-- --:-- -
3 9:00p 11:00p Set 7 --:-- --:-- -
4 --:-- --:-- - 8 --:-- --:-- -
12:00a 4:00a 8:00a 12:00p 4:00p 8:00p 12:00a
Light L.Curve Feed Fill Water Spare
1
2
3
4
5
6

Figure 23. Clocks Screen: Light Tab

If the Control is connected to a remote light dimmer, it is not necessary to have an Output relay assigned to the light clock. If there is a relay assigned to the light clock and the Control is connected to a remote light dimmer, then the Sunset feature will not function.

If it is desired to have the light clock raise the lights from the Min% level to the Max% level several times per day (spiking), then have the lights turn completely off at the end of the day, then the Output going to the light dimmer will need to be wired to an Output relay that is assigned to one of the spare clocks (see spare clocks screen description). The ON At and OFF At time of the Spare Clock event will have to be set so that the Spare Clock relay is on during all of the events entered in the light clock. At the end of the day the Spare Clock will reach the OFF At time and the relay will turn off, turning the lights in the house completely off.

The graphic at the bottom of the screen shows the current time of day (dashed line with an arrow at the top), and the time of day when the light clock relays will be on (shaded area), or if the dimmer control option is used when the lights will be at the maximum light level (also shaded area). The non-shaded area represents when the light clock relays will be off or when the lights will be at the minimum light level (if light dimmer is used).

(Clocks Screen) Light Clock Curve Tab

To access the Clocks "Light Clock Curve" Screen press the Tab Key under "L. Curve".

1. Bend Point-This is the current displayed bend point of the Light Clock Curve. Only one bend point can be shown at a time. To scroll from one bend point to another use the Index Keys .
2. Active From Day-The is the day that the ON At and OFF At times shown in the current bend point will become the active light clock settings.
3. Minimum and Maximum Light Dimmer setting-See the current light clock screen for description.
4. Sun-Use this column to choose whether or not an event will have a: sunrise only, sunrise and sunset, or no sunrise or sunset.
5. The graphic at the bottom of the screen shows the current time of day (dashed line with an arrow at the top), and the time of day when the light clock relays will be on (shaded area), or if the dimmer control option is used when the lights will be at the maximum light level (also shaded area). The non-shaded area represents when the light clock relays will be off or when the lights will be at the minimum light level (if light dimmer is used).

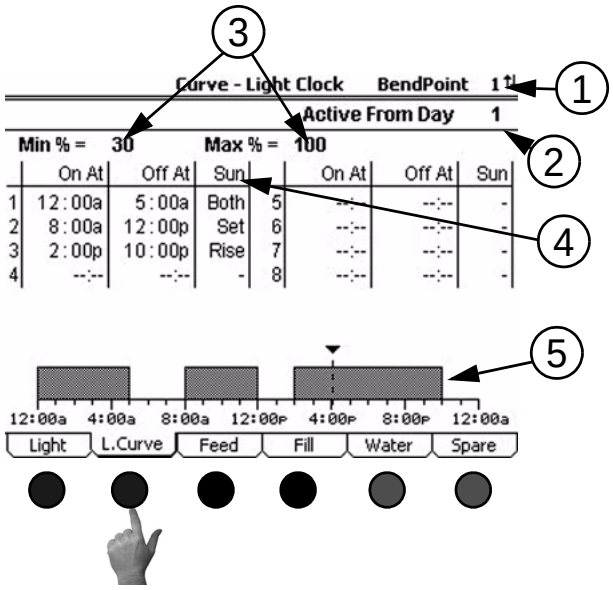

3
Curve - Light Clock BendPoint 1
1
Active From Day 1
2
Min % = 30 Max % = 100
On At Off At Sun On At Off At Sun
1 12:00a 5:00a Both 5 --:-- --:-- -
2 8:00a 12:00p Set 6 --:-- --:-- -
3 2:00p 10:00p Rise 7 --:-- --:-- -
4 --:-- --:-- - 8 --:-- --:-- -
4
5
12:00a 4:00a 8:00a 12:00p 4:00p 8:00p 12:00a
Light L.Curve Feed Fill Water Spare

Figure 24. Clocks Screen: Light Clock Curve Tab

(Clocks Screen) Feed Clock Tab

To access the Clocks "Feed Clock" Screen, press the Tab Key under "Feed". The Feed tab is used to setup when the Control will turn on the feed line relays. If both males and females are going to be fed by the Control, then each feed line clock can be setup separately. This tab is also where the time is set up to lower the male winch (if used). Use the index keys to move between the Female Feed line Clock, the Male Feed line Clock, and the Male Winch clock.

1. Events: The desired number of timed events. The maximum number is 24.
2. Feed/Non-Feed Day: This indicates whether today is a Feed day (The Control will turn on the Feed line relay(s)) or a Non-Feed day (The control will not turn on the Feed line relay(s)). The schedule determines whether or not today is a Feed day or a Non-Feed day.
3. Schedule: This is where the Feed and Non-Feed day schedule is set. If a day of the week is set to R than the events listed in the clock will happen that day. If a day of the week is set to a - then the events listed in the clock will NOT happen that day. The first line of the schedule indicates the Feed and Non-Feed days of the current week. The second line of the schedule indicates the Feed and Non-Feed days of the next week. The schedule will be repeated every two weeks.
4. Start Time: The time of day that an event will start.
5. Run For: The amount of time (in hours:minutes:seconds) that an even will run.

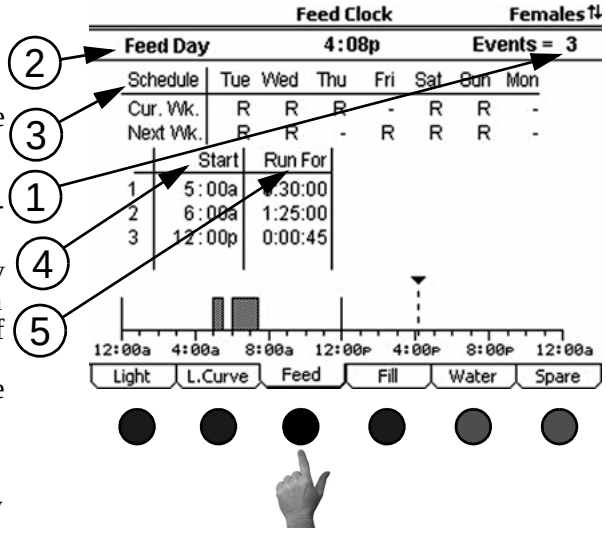


Figure 25. Clocks Screen: Feed Clock Tab

(Clocks Screen) Fill Tab

To access the Feed Clock Fill Screen, push the Tab Key under "Fill". The Fill tab is used to setup when the control will turn on the Fill System Relays. If both males and females are going to be fed by the control, then each feed line clock can be setup separately. Use the index keys to move between the Female and Male Fill clocks.

1. Events: The desired number of timed events. The maximum number is 24.
2. Current Preset
   - 2a. Dump Scale: This is the amount of feed to be delivered by the dump scale. The control will turn off the fill system clock relay(s) once this amount has been delivered. This amount delivered will then be recorded in the Today's Feed section of the Auxiliary Data screen and the Amount Filled today line below.
   - 2b. Mechanical (beam) Scale: The number is used for management purposes only. The fill system will turn off when the upper switch of the beam scale opens during the Fill System run time. Once the amount of feed has been delivered, the amount entered in the Current Preset line will be recorded in the Today's Feed section of the Auxiliary Data screen and the Amount filled today line below.
3. Amount filled today: The amount of feed brought into the house today.
4. Reset the preset: Changing this line resets the current amount of preset fed back to 0. Resetting the preset informs the control that feeding for the house is complete for today and that any feed events that happen after the preset has been reset gets credited to the next feed day. The Preset must be reset after a feeding is complete. The Preset can be reset automatically at a certain time of day. See the Setup-Control screen, Other tab for more information.
5. Start Time: The time of day that an event will start.
6. Run For: The amount of time (in hours:minutes:seconds) that an even will run.

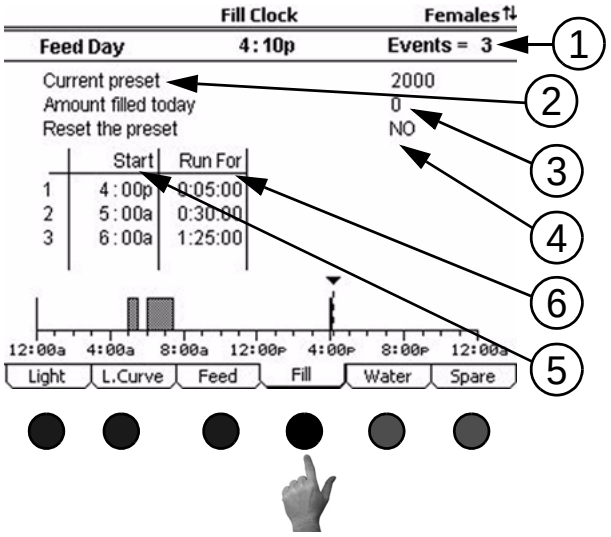


Figure 27. Clocks Screen: Fill Tab

(Clocks Screen) Water Tab

To access the Clocks "Water" Screen, press the Tab Key under "Water. The Water tab is used to setup the watering schedule of the house. There can be two different water schedules available: one schedule for feed days and one schedule for non-feed days. The Feed and Non-Feed days are determined by the female feed line run schedule setup in the "Feed" tab. Use the index keys to move between the Feed day and the Non-Feed day water clock schedules.

1. Events: The desired number of timed events. The maximum number is 24.
2. Start Time: The time of day that an event will start
3. Run For: The amount of time (in hours:minutes:seconds) that an even will run.

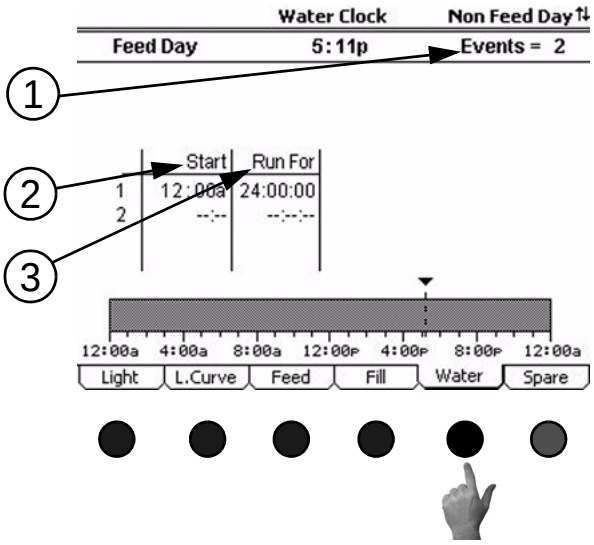


Figure 28. Clocks Screen: Water Tab

(Clocks Screen) Spare Clock Tab

To access the Clocks "Spare Clock" Screen, press the Tab Key under "Spare". The Spare Clocks have 8 on and off events and can not be curved. A maximum of 8 Spare Clocks can be used. To scroll from one Spare Clock to another use the Index Keys . Each Spare Clock can be given a specific name to identify the clock with a particular use. The Spare Clock(s) name is entered in the Setup-General:Outputs screen (Screen 13-Outputs tab).

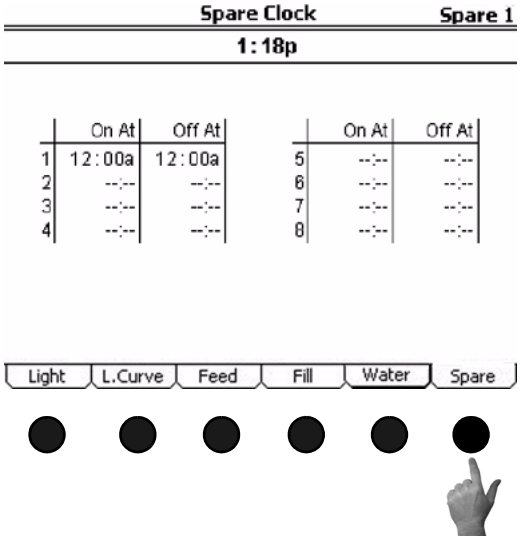


Figure 29. Clocks Screen: Spare Clock Tab

Screen 6: History-Production

The History-Production screen consists of Mortality (Mortality Tab) History, Water Meter (Water Tab) History, Feed (Feed Tab) History, Auxiliary Digital Inputs (Dig. In. Tab), History and the Reset History-Production screens.

(History-Production Screen) Water Meter History Tab

To access the History "Water Meter History" Screen, press the Tab Key under "Water". The Water History Screen displays the usage of every water meter connected to the drinker lines for the last 6 days plus today in the top half of the screen. The bottom half of the screen displays the amount of water used for the last 50 weeks. Only one meter is displayed at a time. To scroll to another water meter, use the Index Keys Keys . Each water meter can have its own name to specify what water line it is connected (Brood Meter, Grow out Meter, etc.). For water meters that are NOT connected to the drinker lines see the Auxiliary Digital Inputs History screen.

The total column displays the total of all water meters connected to the drinker lines in the house.

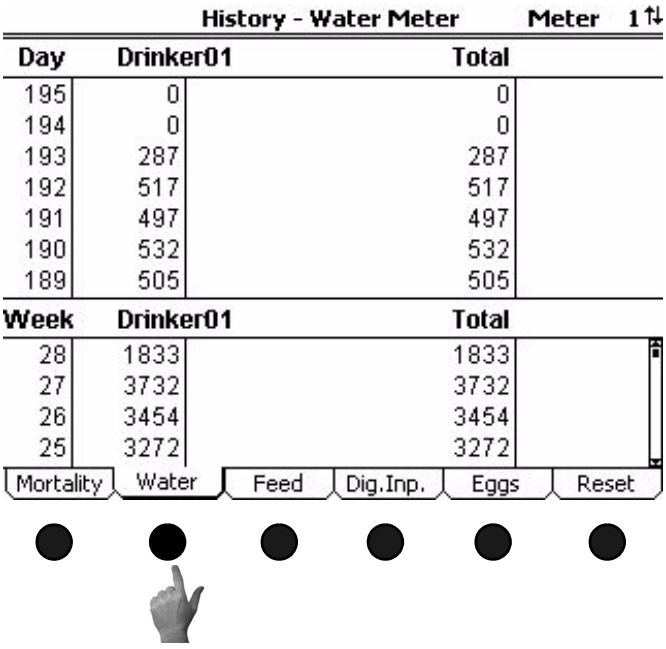


Figure 30. History-Production Screen: Water Meter History Tab

(History-Production Screen) Feed Scale History Tab

To access the History-Production "Feed Scale History" Screen, press the Tab Key under "Feed". The Feed History Screen displays the amount of feed fed for the last 6 days plus today in the top half of the screen. The bottom half of the screen displays the amount of feed fed for the last 50 weeks. Only one scale is displayed at a time. To scroll to another scale, use the Index Keys . Each scale can have its own name to specify what water line it is connected (Male, Female, etc.).

The total column displays the total of all water meters connected to the drinker lines in the house.

Note: If the dump feed scale is used, feed will automatically be recorded as it is being measured through the scale. If the mechanical (balance beam) scale is being used, this screen is for recording purposes only and there must be a preset entered in the Fill Clock (Clocks screen, fill tab).

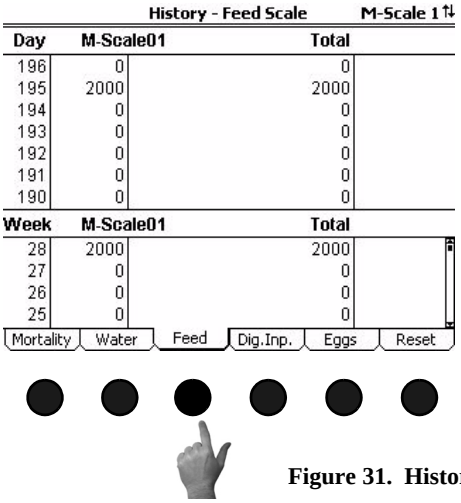


Figure 31. History-Production: Feed Scale History Tab

(History-Production Screen) Mortality History Tab

To access the History-Production "Mortality History" Screen, push the Tab Key under "Mortality". Mortality Tab: The Mortality History Screen displays the number of dead, culled and total mortality for the last 6 days plus today in the top half of the screen. The bottom half of the screen shows the number of dead, culled and total mortality for the last 50 weeks. If female and male birds are being entered separately, the total male and female mortality will be shown in the screen as well.

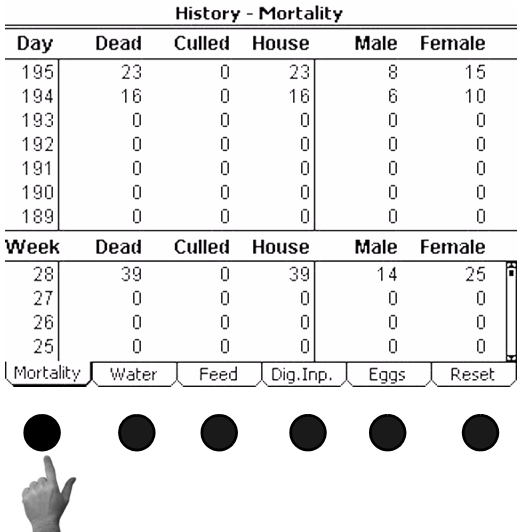

History - Mortality
Day Dead Culled House Male Female
195 23 0 23 8 15
194 16 0 16 6 10
193 0 0 0 0 0
192 0 0 0 0 0
191 0 0 0 0 0
190 0 0 0 0 0
189 0 0 0 0 0
Week Dead Culled House Male Female
28 39 0 39 14 25
27 0 0 0 0 0
26 0 0 0 0 0
25 0 0 0 0 0
Mortality
Water
Feed
Dig.Inp.
Eggs
Reset

Figure 32. History-Production: Mortality History Tab

(History-Production Screen) Egg History Tab

To access the History-Production "Egg History", press the Tab Key under "Eggs". The Egg History screen will display the number of hatching eggs and the total number of eggs entered for the last 6 days plus today in the top half of the screen. The bottom half of the screen will show the total number of hatching eggs and the total number of eggs entered for the last 50 weeks.

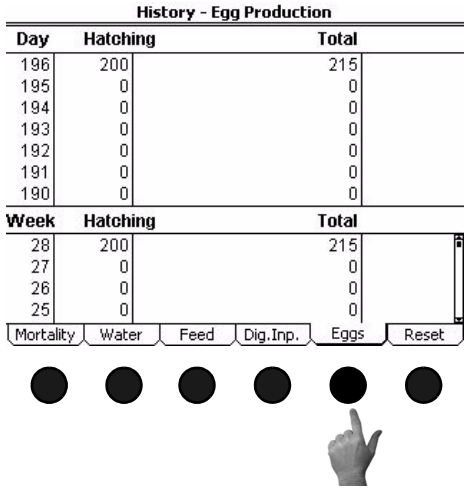


Figure 33. History-Production Screen: Egg History Tab

(History-Production Screen) Reset History Tab

To access the History-Production "Reset History screen", press the Tab Key under "Reset".

To access the History-Production "Reset History" Screen, press the Tab Key under "History". This screen will show the readings for all auxiliary digital inputs for the last 6 days plus today in the top half of the screen. The bottom half of the screen displays the readings for the last 50 weeks of all auxiliary digital inputs. An auxiliary digital input can consist of water meters not connected to the drinker lines (for example a cool pad water meter), pulsed output gas meters, pulsed output electric meters, etc. Each auxiliary digital input can have its own name to identify what kind of device is connected to the input.

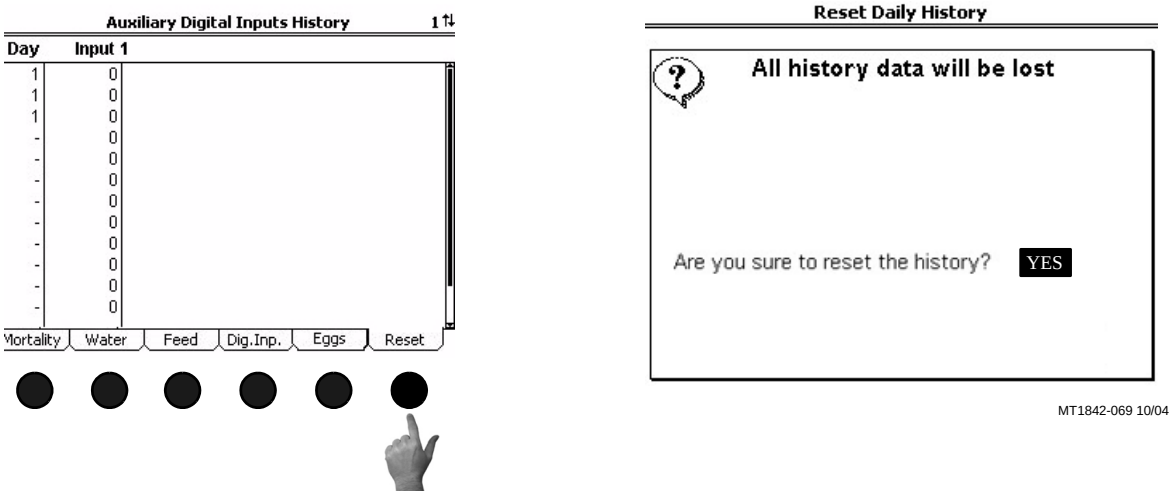


Figure 34. History-Production Screen: Reset History Tab

Screen 7: History-Environment

The History-Environment Screen consists of the Mode Temperature History, Relative Humidity History (if used), Heat Zone Runtime History, Individual Temperature Sensor History, and the Reset History-Environment screens.

(History-Environment Screen) Mode Temperature History Tab

To access the History-Environment "Mode Temperature History Tab, press the Tab Key under "Temp". The Mode Temperature History Screen shows the maximum and minimum temperatures of the Mode Sensor(s) along with the time of day that the temperature occurred. Since the mode temperature sensors may be different for different ventilation modes, it is possible that the maximum temperature occurred on a different sensor(s) than the minimum temperature. The Mode Temperature History Screen displays the maximum and minimum mode temperatures for the last 13 days plus today.

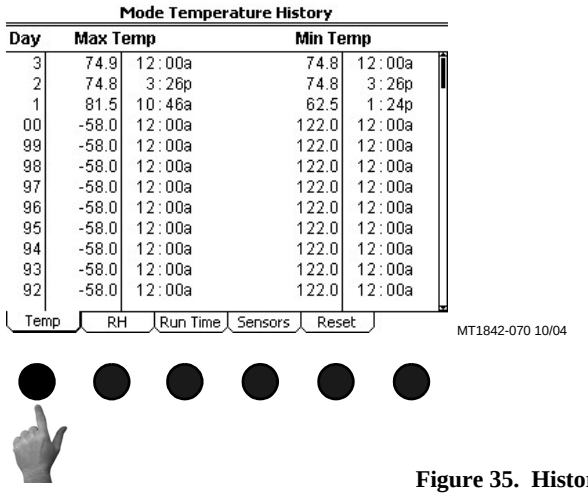


Figure 35. History Screen: Temp Tab

(History) Relative Humidity History Screen

To access the History "Relative Humidity History" Screen, press the Tab Key under "RH". The Relative Humidity Screen shows the maximum and minimum relative humidity reading along with the time of day that the reading occurred. Use the index Keys to toggle between House Relative Humidity and Egg Room Relative Humidity. Both Screens display the maximum and minimum relative humidity for the last 13 days plus today.

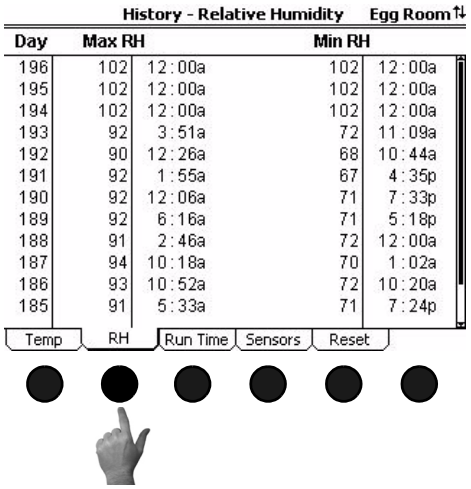


Figure 36. History Screen: Relative Humidity Tab

(History) Heat Zone Runtime History Screen

To access the History "Heat Zone Runtime History" Screen, press the Tab Key under "Run Time". This screen displays the amount of time each Heat zone has ran for a particular day. Only one heat zone is displayed in the screen at a time. To scroll to another heat zone, use the Index Keys . The Individual Heat Zones can be given a specific name to indicate location in the house or for use with brooders/ heaters with multiple heating levels. The Heat Zones can be named in the Setup-General: Outputs screen (Screen 13, Outputs Tab). The Heat Zone Runtime History shows the runtime of the individual heat zones for the last 6 days plus today in the top half of the screen. The bottom half of the screen shows the runtime of the individual heat zones for the last 50 weeks..

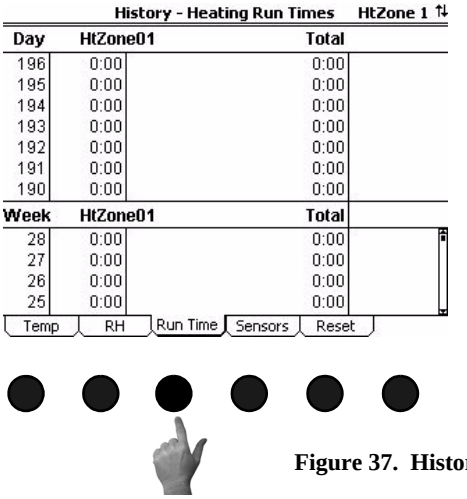


Figure 37. History Screen: Heat Zone Runtime Tab

(History) Individual Sensor History Screen

To access the History "Individual Sensor History" Screen, press the Tab Key under "Sensors". This screen shows the maximum and minimum temperatures of the individual Sensors along with the time of day that the temperature occurred. This screen can display the history of all 12 controlling temperature sensors and any auxiliary temperature sensors that may be connected to the control. Only one temperature sensor is displayed in the screen at a time. To scroll to another sensor, use the Index Keys . The Individual Sensor History Screen displays the maximum and minimum mode temperatures for the last 13 days plus today.

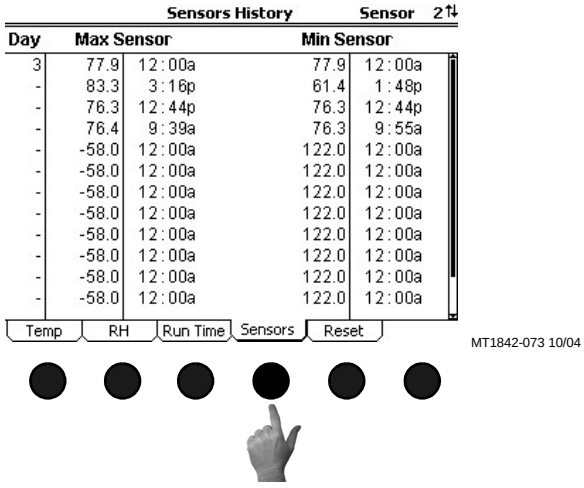


Figure 38. History Screen: Individual Sensor Tab

(History) Reset History-Environment Screen

To access the Reset History "Reset History-Environment Screen", press the Tab Key under "Reset". This screen is where the user can tell the control to erase all of the current environment history data stored in the control. Answer "YES or "NO" to "Are you sure to reset the history".

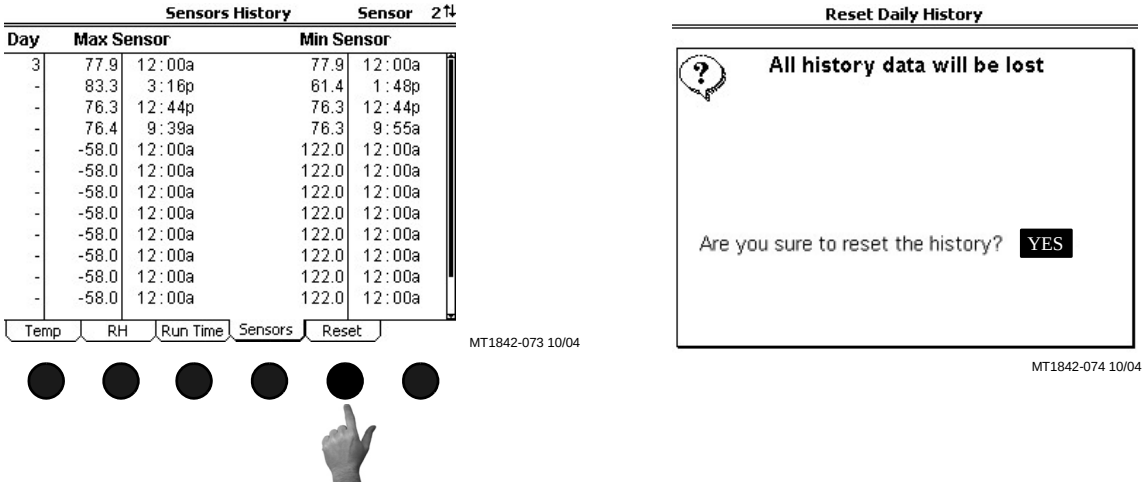


Figure 39. History Screen: Reset History-Environment Tab

Screen 8: Alarms

The Alarms Screen consists of the Alarm Overview, Alarm Settings, and Alarm History Screen. The Indicator Light (LED) next to the number 8 Subject Button indicates the current status of the Alarm. The Alarm Status's are as follows...

1. Solid Green- All is normal (No Alarm)
2. Flashing Green- Warning, un-noticed alarm, or temporary off alarm
3. Flashing Red- Active Alarm

(Alarms Screen) Overview Tab

To access the Alarms "Overview screen", press the Tab Key under "Overview". This Screen is the list of all currently active or recovered, but not noticed alarms. In **Figure 40** below, a "Min. Temp Alarm" has occurred and recovered. This alarm message will remain listed in this screen until it is recovered. To notice the alarm first press the edit button. Highlight the RECOV field and use the +/- keys to change the status to NOTICE, then press the Enter key. This should remove the alarm from the list.

1. Status-This is the current status of the alarm system. The three possible statuses are ACTIVE, DISABLED, AND TEST. The status field is editable.

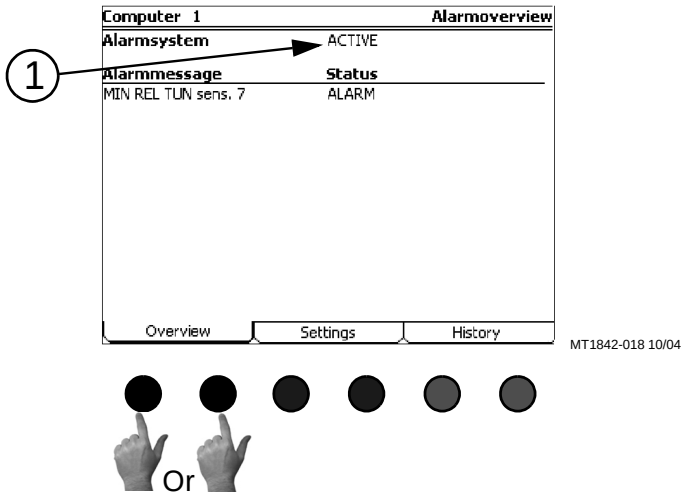


Figure 40. Alarms Screen: Overview Tab

(Alarms Screen) Settings Tab)

‘To access the Alarm "Settings" Screen, push one of the Tab Keys under "Settings"

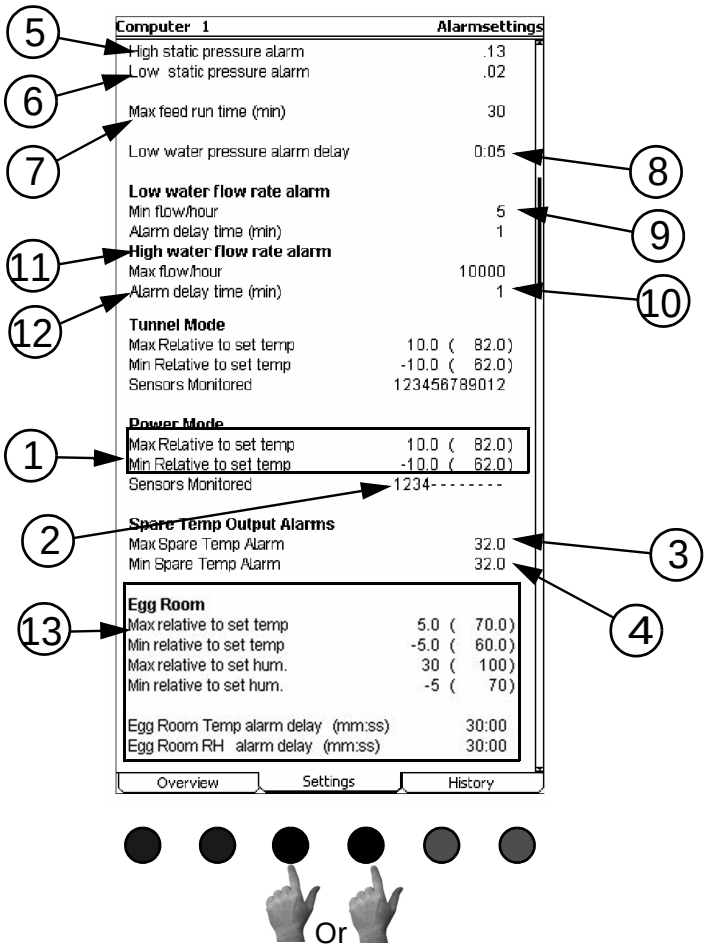


Figure 41. Alarms Screen: Settings Tab

1. Maximum and minimum relative to set temperature alarm settings for every ventilation mode used.
2. Set what sensors should be monitored for the maximum and minimum temperature alarms here for every ventilation mode used. The default settings are the mode temperature sensors for every ventilation mode. If the mode sensors are changed then the alarm sensors monitored will also change to match the mode sensors.
3. Maximum spare temp alarm setting.
4. Minimum spare temp alarm setting.
5. High static pressure alarm setting.
6. Low static pressure alarm setting.
7. Max feed run time alarm setting (in minutes).
8. Low water PRESSURE alarm delay setting.
9. Low water FLOW alarm rate setting.
10. Low water FLOW alarm delay time setting.
11. High water FLOW alarm rate setting.
12. High water FLOW alarm delay time setting.
13. Egg Room alarm settings

(Alarms Screen) Alarm History Tab

To access the Alarms "Alarm History" Screen, push one of the Tab Keys under "History". This screen shows the time, date, and type of alarm of the most twenty recent alarms to occur. The screen also shows how long it took for the alarm to recover and how long it took the user to notice the alarm.

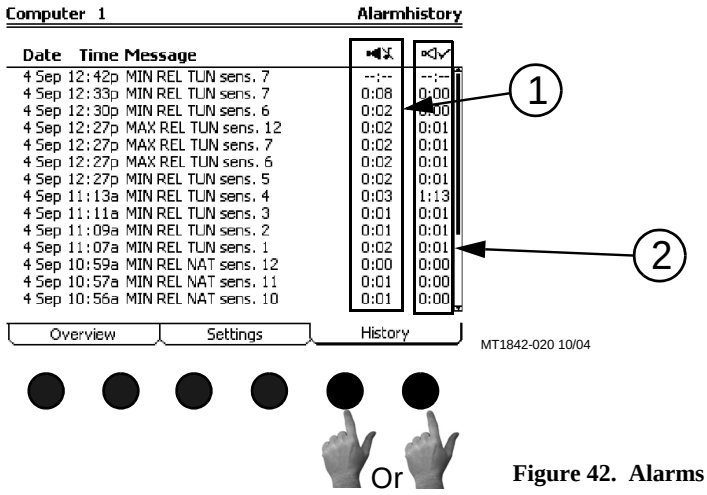

Computer 1
Alarmhistory
Date Time Message
4 Sep 12:42p MIN REL TUN sens. 7 --:-- --:--
4 Sep 12:33p MIN REL TUN sens. 7 0:08 0:00
4 Sep 12:30p MIN REL TUN sens. 6 0:02 0:00
4 Sep 12:27p MAX REL TUN sens. 12 0:02 0:01
4 Sep 12:27p MAX REL TUN sens. 7 0:02 0:01
4 Sep 12:27p MAX REL TUN sens. 6 0:02 0:01
4 Sep 12:27p MIN REL TUN sens. 5 0:02 0:01
4 Sep 11:13a MIN REL TUN sens. 4 0:03 1:13
4 Sep 11:11a MIN REL TUN sens. 3 0:01 0:01
4 Sep 11:09a MIN REL TUN sens. 2 0:01 0:01
4 Sep 11:07a MIN REL TUN sens. 1 0:02 0:01
4 Sep 10:59a MIN REL NAT sens. 12 0:00 0:00
4 Sep 10:57a MIN REL NAT sens. 11 0:01 0:00
4 Sep 10:56a MIN REL NAT sens. 10 0:01 0:00
1
2
Overview
Settings
History
MT1842-020 10/04
Or

Figure 42. Alarms Screen: History Tab

1. The amount of time (hh:mm) it took for the alarm to recover is shown here. 0:00 means that the alarm was recovered within the first minute.
2. The amount of time that elapsed (hh:mm) from the time the alarm condition occurred, until the alarm is NOTICED is shown here.

Screen 9: Curve Settings

The curve settings Screen consists of the Set Temperature Curve, Minimum Ventilation Curve, and Feeder Window Ramp screens.

(Curve Settings Screen) Set Temperature Curve Tab

To access the Curve Settings "Set Temperature" Screen, press one of the Tab Keys under "Set Temperature". There are several terms that need to be defined in order to understand the Set Temperature Curve Tab Screen.

1. A “curve” is a listing of up to 10 points in time (bend points) that defines how you want a parameter to automatically vary as the animals grow. You make the Control do that by turning the curve “on”.
2. Curve Value-This indicates the current value(s) of the specified curve.
3. The Bend Points (BPs)-are points on the curve that define the curve. The curve values are adjusted between the Bend Points. The bend point values are the exact values at midnight of the day # of each Bend Point. The curve takes over when you turn the curve “on” and the day number is equal to or greater than the day number assigned to BP #1.
4. Day-The intention is that the day # is age of the animals. Negative days (down to – 7) are allowed if it is desired to preheat the house, for example, prior to the arrival of the animals. The day # of a BP can also be negative, if desired. Changing the day # in any screen that shows the day number, will change the day # in all the other screens that show the day #.

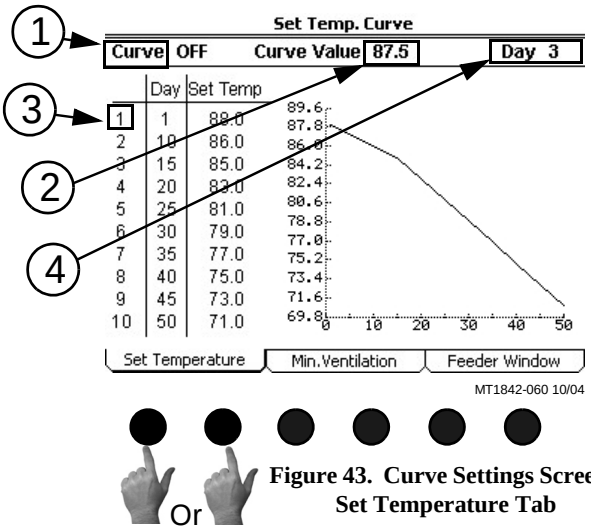


Figure 43. Curve Settings Screen: Set Temperature Tab

The graphs on the right side of Set temperature screen shows the progress of the curve. The dashed line indicated the current day number of the curve.

(Curve Settings Screen) Minimum Ventilation Curve Tab

To access the Curve Settings "Minimum Ventilation" Screen, press the Tab Key under "Min. Ventilation". There are several terms that need to be defined in order to understand the Minimum Ventilation Curve Screen.

1. A “curve” is a listing of up to 10 points in time (bend points) that defines how you want a parameter to automatically vary as the animals grow. You make the Control do that by turning the curve “on”.
2. Curve Value-This indicates the current value(s) of the specified curve.
3. The Bend Points (BPs)-are points on the curve that define the curve. The curve values are adjusted between the Bend Points. The bend point values are the exact values at midnight of the day # of each Bend Point. The curve takes over when you turn the curve “on” and the day number is equal to or greater than the day number assigned to BP #1.
4. Day-The intention is that the day # is age of the animals. Negative days (down to – 7) are allowed if it is desired to preheat the house, for example, prior to the arrival of the animals. The day # of a BP can also be negative, if desired. Changing the day # in any screen that shows the day number, will change the day # in all the other screens that show the day #.

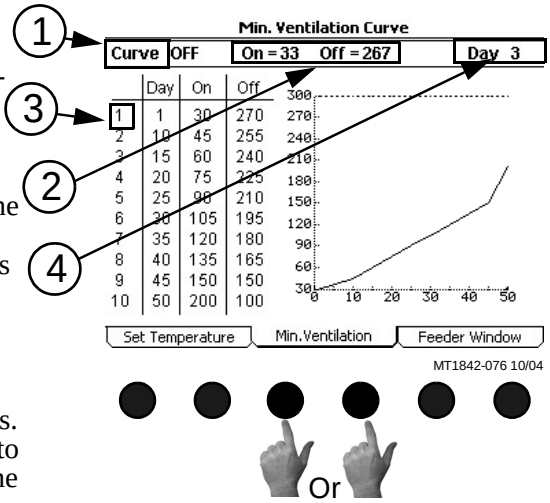


Figure 44. Curve Settings Screen: Minimum Ventilation Curve Tab

The graphs on the right side of the Minimum Ventilation Curve screen shows the progress of the curve. The dashed line indicated the current day number of the curve.

(Curve Settings Screen) Feeder Window Curve Tab

To access the Curve Settings "Minimum Ventilation" Screen, press the Tab Key under "Feeder Window".

A maximum of two separate Feeder Window Curves can be defined. Use the index keys to change from Feeder Window Curve 1 to Feeder Window Curve 2. Feeder Window Curve is shown. Each Curve will have its own open and close relays assigned to it.

The feeder window curve allows the automatic closing and/or opening of the Revolution® Feeder flood windows via an actuator. Relays must be assigned to the FEED WIN OP and the FEED WIN CL relays in order for this screen to appear. There are 10 bend points in the curve with each bend point having a day setting and a feeder window position setting. A position number of 1 indicates the windows are fully open and a position of 10 indicates that the windows are fully closed. The control moves the windows to a new position on the curve at midnight of the day indicated on the bend point. If either the open or the close switch is moved into the manual position the curve will automatically turn off and a pop up window **(Figure 44 below)** will appear telling the user that the curve is turned off. The feeder window curve screen will then indicate that the feeder window is in MANUAL control.

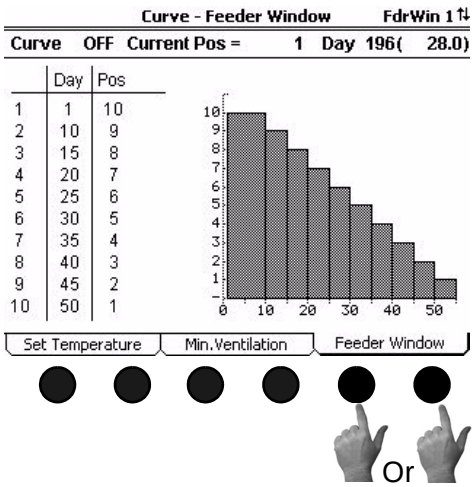


Figure 45. Curve Settings Screen: Feeder Window Curve Tab

```
Feeder Window Curve is off
and not controlled anymore

Press any key
```

Figure 46. Feeder Window Curve is Off

When both the open and closed switches are placed back in the automatic position the control will re-calibrate the feeder windows by closing the window completely and then opening to the Current Position. While the control is re calibrating the control will show RECALIBRATING in the feeder window screen.

Screen 10: Management Screen

The Management Screen consists of the Mortality, Water, Feed, Management, and Reset Management screens.

(Management Screen) Mortality Tab

To access the Management "Mortality" Screen, press the Tab Key under "mort". The number of dead and culled animals collected is entered on the Picked Up line. When agreed is changed to YES the number(s) entered in the picked up line will be added to the Today and the Accum lines. The %Mort and the Curr (Current) Housed will be recalculated. The total daily mortality will also appear in the Daily History-Production screen. If Males and Females are being entered separately, use the index keys to toggle between the Male, Female and Total Screens. When Male and Female Mortality is entered separately, the Total Mortality Screen is a summary of the Male and Female screens and is non-editable. See the Setup-General: House Equipped for (Screen 13: Equip.For tab) to tell the control to keep track of Male and Female Mortality separately.

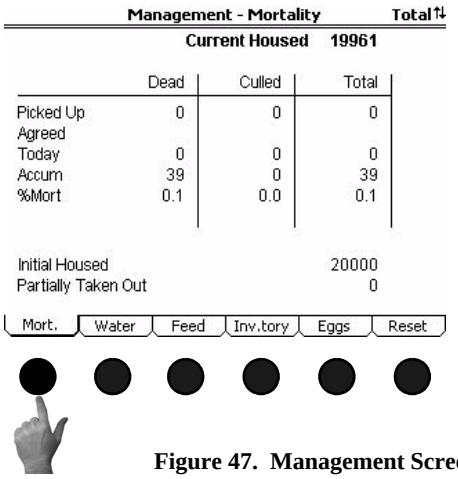


Figure 47. Management Screen: Mortality Tab

(Management Screen) Water Tab

To access the Management "Water" Screen, press the Tab Key under "water". This screen will be available if a drinker line Water Meter is connected to the control. This screen indicates the total water consumed in the house and how much water has been consumed in a certain period of time (for example, how much water was consumed in the house in the previous 5 minutes). If house mortality is being entered into the control, then the total amount of water per 1000 birds (or per animal) will also be displayed.

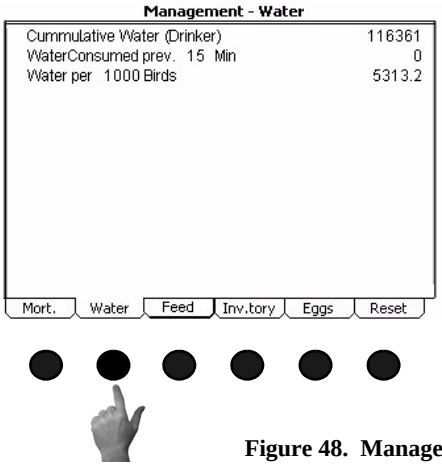


Figure 48. Management Screen: Water Tab

(Management Screen) Feed Tab

To access the Management "Feed" Screen, press the Tab Key under "feed". This screen displays the amount of feed fed, and how much feed was used in a certain period of time (for example, how much feed was consumed in the house in the previous 5 minutes). If mortality is being entered into the control, then the total amount of feed per bird, 100 birds, or 1000 birds will also be displayed. If males and females are being fed separately, use the index keys to look at individual feeding information for the males and females.

In the total feed screen the control will show the water to feed relationship (water: feed relation). This is the amount of water in gallons (litres) consumed per pound (kilogram) of feed consumed.

In the female (or male) feed screen the control can show an ESTIMATED feed conversion for the females (or males). This requires that the ESTIMATED weight be entered and that mortality of the house is being entered into the control.

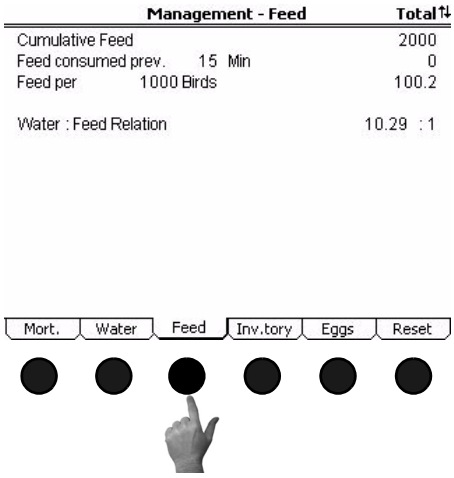


Figure 49. Management Screen: Feed Tab

(Management Screen) Inventory Tab

To access the Management "Inventory" Screen, press the Tab Key under "Inv.tory". If it is desired for the Control to keep track of the approximate feed bin inventory of the house, then an amount of feed must be entered in the Feed Delivered line and Agree must be answered YES. This will put the amount of feed delivered into the Bin Inventory line. When feed is delivered again to the feed bin, enter the amount delivered in the Feed Delivered line and change the agreed line to YES. This will add the amount of feed delivered to the Bin Inventory. The amount of Feed Delivered must be entered for every feed delivery made to the house. If the males and females are being fed different rations, then the inventory of 2 separate bins (bin 1 and bin 2) can be tracked. To assign which bin is the female and which bin is the male ration see the Setup-General Screen, "Digital Inputs" Tab.

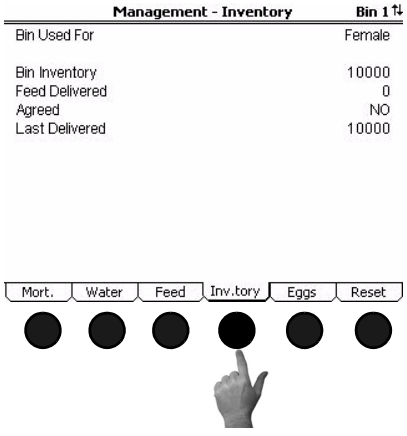


Figure 50. Management Screen: Inventory Tab

(Management Screen) Eggs Tab

To access the Management "Eggs" Screen, press the Tab Key under "Eggs". In the "Eggs" screen the number of hatching, culled and double yoke eggs is entered on the Collected line. When agreed is changed to YES the number(s) entered in the Collected line be added to the Total line. The control will also calculate the number of eggs per 1000 pounds (kilograms) of feed and also the number eggs per hen, per 100 hens, or per 1000 hens. Use the index keys to change the egg screen from today to the week. In the week the total number of hatching, culled and double yoke eggs along with eggs per 1000 pounds and per 1000 hens will be displayed for the current week.

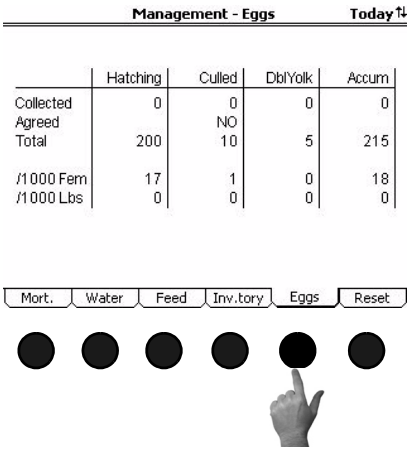


Figure 51. Management Screen: Eggs Tab

(Management Screen) Reset Management Tab

To access the Management "Reset" Screen, press the Tab Key under "Reset". This Screen is where the user can tell the Control to erase all of the current management data stored in the Control. Answer "YES" or "NO" to "Are you sure to reset management".

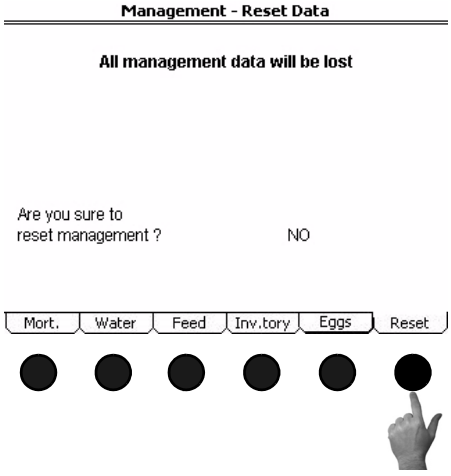


Figure 52. Management Screen: Reset Tab

Screen 11: Static Pressure

Screen 11, **(Figure 53)** indicates the current static pressure plus provides the fields that can be edited to set the Static Pressure Control limits and the wind delay. The open and close Inlet Relays respond as required to keep the static pressure within the Control limits while in the Power Mode and the open and close Tunnel Curtain Relays do the same to control the static pressure during the Tunnel Mode. If it is not desired to control the static pressure during the Tunnel Mode, the high control limit in the Tunnel Mode must be edited to be .00. Static Pressure Control w/ Tunnel Curtain during Power Mode-If in the Power Mode, there is inadequate inlet area to keep the static pressure within the high control limits, the Tunnel Curtain will open to give additional air inlet area. The Inlets are given continuous open signals as the Tunnel Curtain takes over the responsibility of controlling the static pressure. The static pressure has to be above the high Static Pressure Control limit continuously for one minute with 3 or more Fans running for this to happen. Responsibility for Static Pressure Control is passed back to the Inlets as soon as there are fewer than 3 Fans running or the Tunnel Curtain cannot bring the static pressure back into the control range (while closing) from the low side. The static pressure has to be below the low Static Pressure Control limit continuously for one minute for this to happen.

Static Pressure Safety limits-When the static pressure stays above 0.20 for a continuous minute, the Tunnel Curtain (if in Power Mode) and the Inlets (if in Tunnel Mode) will open until the static pressure reduces below 0.20. Once the problem is fixed and the static pressure reduces below 0.18, the Control returns to normal operation. This situation will always result in a High Pressure Alarm.

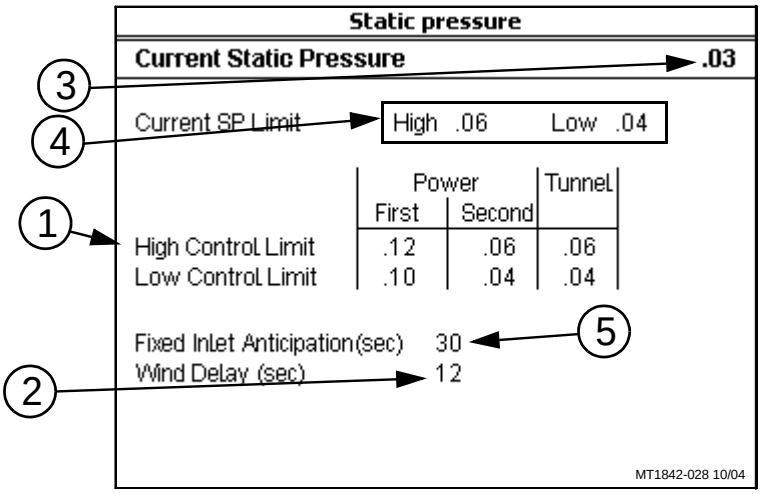


Figure 53. Screen 11: Static Pressure Screen

1. Static Pressure Control limits-The Static Pressure Control limits are the values of static pressure the Control attempts to maintain by using the powered Inlets, the Tunnel Curtain, or both. A second level of Power Mode static pressure can be chosen in screen 13. The temperature at which the second static pressure takes over is entered in screen 4. The Temperature Sensor(s), (Inside Only), that measure that temperature is defined in screen 13.
2. Wind delay-The wind delay is the amount of time the static pressure has to be continuously outside of the Control limits before the appropriate open or close Relay will be energized to bring the static pressure back within the control limits. The wind delay is bypassed if a Fan or Fans turning on or off is what causes the static pressure to move outside the Static Pressure Control limits.
3. Current Static Pressure-Current Static Pressure is the amount of static pressure currently measured by the Control.
4. Current SP Limits-The Current SP Limits are the current high and low limit settings the Control is using to control the inlets or tunnel curtain.
5. Fixed Inlet Anticipation-Fixed Inlet Anticipation is the amount of time the inlets will open prior to the fans assigned to the Minimum Ventilation timer turn on. Fixed inlet anticipation must be set to YES in the Setup-Control screen (Screen 14- Input tab).

Screen 12: Programs

The Programs Screen consists of the Available Programs, Activate Program Settings, Delete Program Settings, Save Program Settings, Yesterday's Settings, and the Setup Key Screens. This is a very powerful screen that allows the user to store up to 6 complete setups of the Control that can be re-activated at any time. This screen is also where control settings can be downloaded to or uploaded from the setup key.

(Programs Screen) Available Program Settings Tab

The Programs "Available Program Settings" Screen shows the name and program number of the current active program. The screen also shows the list of all available program numbers and names. There are no editable fields in this screen.

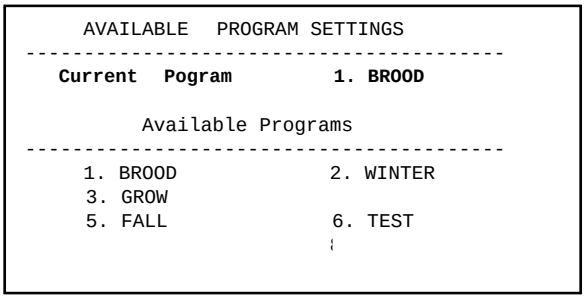


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Figure 54. Programs Screen: Available Program Settings Tab

(Programs Screen) Activate Program Settings Tab

To access the Programs "Activate Programs" Screen, press the Tab Key under "Settings". In this screen a program can be selected and activated to be the current program. To activate a new program, highlight the program listed in the Select Program line and scroll until the desired program is in the display. Press the Enter key, then answer "YES" or "NO" to "Do you want to activate the selected program".

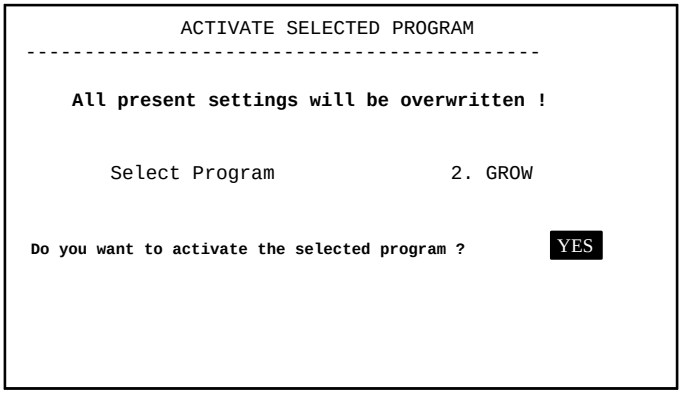
ACTIVATE SELECTED PROGRAM
All present settings will be overwritten !
Select Program 2. GROW
Do you want to activate the selected program ?
YES

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Figure 55. Programs Screen: Activate Program Settings Tab

(Programs Screen) Delete Program Settings Tab

In this screen a program can be selected and deleted. To delete a program, highlight the program listed in the Select Program line and scroll until the desired program is in the display. Press the Enter key, then answer "YES" or "NO" to "Do you want to delete the selected program".

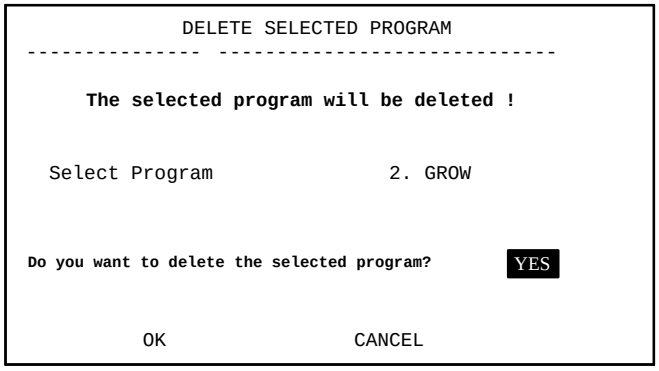

Figure 56. Programs Screen: Delete Program Settings Tab

(Programs Screen) Save Program Settings Tab

This is the screen where the current settings of the Control can be saved as a program. To save the current settings, first enter the program number to be saved in the Program Number line. Then enter a program name using the alpha-numeric keys in the Program Name line. Once all information is correct, answer "YES" or NO" to "Do you want to save all settings to the selected program".

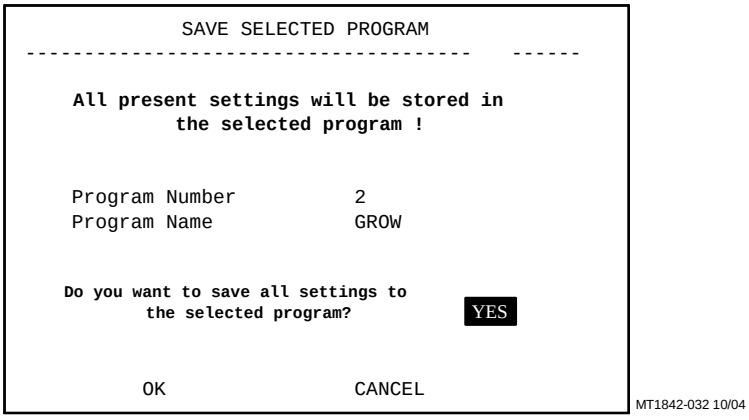

Figure 57. Programs Screen: Save Program Settings Tab

(Programs Screen) Yesterday's Settings Tab

Everyday at midnight, the settings of the Control is saved which can be activated anytime during the following. This can be helpful if a mistake in setup is made and it is desired to undo the changes. To go back to yesterday's settings, press the tab key below the word OK. If it is not desired to go back to yesterday's settings, press the tab key below the word CANCEl.

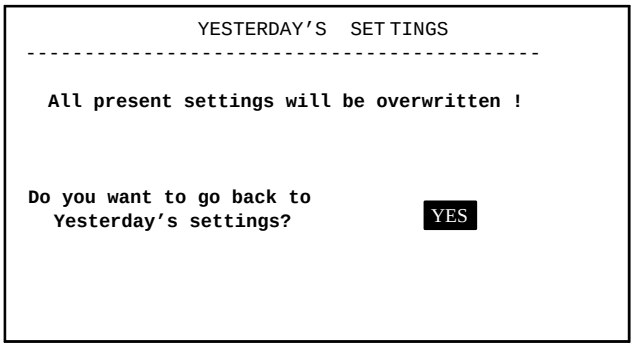

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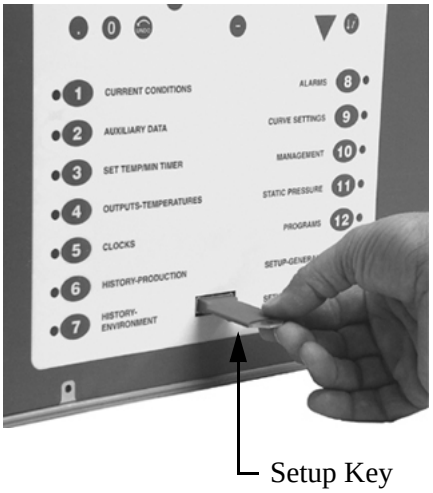
Figure 58. Programs Screen: Yesterday's Settings Tab

(Programs Screen) Setup Tab

This screen is only available if a Setup Key is inserted in the plug located on the front of the Control **(See Figure 59 below)**. The Setup Key should be inserted so that the tab on the bottom of the Key lines up with the notch on the Control.



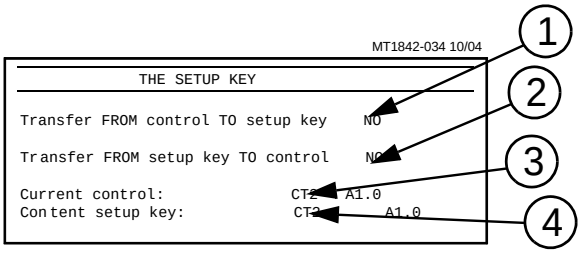


Figure 59. Programs Screen: Setup Tab

1. Transfer FROM Control TO Setup Key-If it is desired to transfer all of the Controls settings to the setup key, change the NO to YES. The following screen will appear **(Figure 60)**. To transfer the settings from the Control to the Setup Key, press the Tab Key below the word OK. If it is not desired to transfer the settings from the Control to the Setup Key, press the Tab Key below "CANCEL" to return to the previous screen.

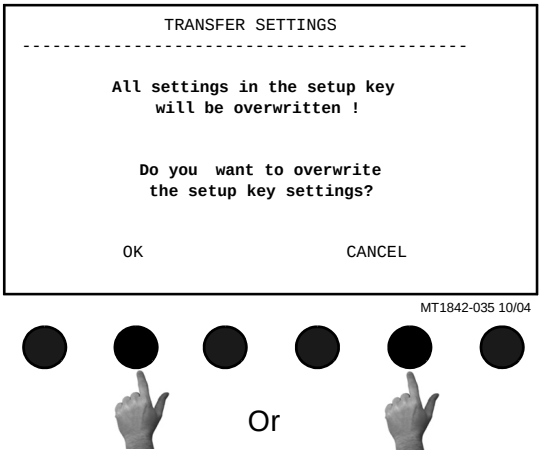


Figure 60. Trans. From Control to Setup Key

2. Transfer From Setup Key to Control-If if is desired to transfer the settings currently stored on the Setup Key to the Control then change the NO to YES. The Screen at the right will appear **(Figure 61)**. To transfer the settings from the Setup Key to the Control press the Tab Key below "OK". If it is not desired to transfer the settings from the Setup Key to the Control press the Tab Key below "CANCEL" to return to the previous screen.
3. Current Control-The current software level operating on the Control
4. Content setup key-The software level of the contents stored on the Setup Key. The software level stored on the Setup Key must match the current Control software level in order to transfer settings from the Setup Key to the Control.

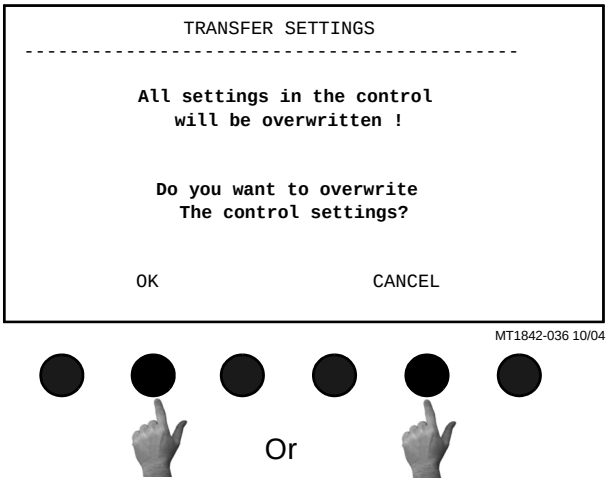


Figure 61. Transfer from Setup Key to Control

Setup Screens (Screens 13 & 14) and Initial Setup

The setup screens (Screens 13 and 14) is where the Control is told what it is controlling. The Control is told which relays to control based on which sensors (if the Output is controlled by temperature). The Control is also told which ventilation mode(s) the Output relays are allowed to operate. Many of the settings that are entered into these screens determine what will appear in several other screens.

Once the Control has been properly installed and all Outputs have been tested manually, the Control is now ready to be set up. The following sections should be used only as a guide to setting up the Control. These sections will provide a general overview and procedure for programming and setting up the Control.

Before beginning to set up the Control, make sure that all of the toggle switches in the relay box (es) have been placed in the manual "off" position. This will insure that no Outputs will accidentally turn on during setup. Also make sure that the Output stickers have been placed over the correct toggle switch and that the Input assignment decal has been filled in properly. This will aid in programming the Control.

Special Note: When first powering up and setting up the Control, the light next to the alarms button (button #8) may flash red or green. Ignore this flashing light until the Control is fully set up.

Screen 13: Setup-General

(Setup-General Screen) General Tab

Go to the Setup-General "General Screen" (Screen 13), by pushing Subject button 13.

1. Control number- Enter the Control's Control number here. The Control number should match the house number. This is especially important if C-Central is being used.
2. Temperature unit- Select which temperature unit (Fahrenheit or Celsius) the Control will display the temperature sensor readings.
3. Units of measurement- Select which unit of measurement (non-metric or metric) the Control will use for measurements such as water, feed and curtain measurements.
4. Clock Type-Select which clock type (12H or 24H) the Control will use to display the time of day and to use in the Clocks (Screen 5) screen.
5. Time of Day-Enter the current time of day.
6. Number of relays- Select the number of Output relays (32-80 in multiples of 8) that are currently connected to the Control.
7. Date-Enter the current Date
8. Change access code- The Control comes set from the factory with no access code required to make changes. If an access code is desired first change the "NO" to a "YES" at the change access code line. The Control will then ask for the old password. From the factory the old password is 1111. This is entered by pushing the number 1 on the numeric keypad 4 times and pressing enter. Next enter a new access code by using the numeric keypad and press enter. The Control will then ask for confirmation of the new access code. Once an access code has been entered, the Control will ask for that code any time the control has set idle (no buttons pressed) for more than 5 minutes, and the edit button is pushed. If an access code is no longer desired, change the access code back to the factory setting of 1111, and no code will be required to make changes.
9. Application version and Serial number- The current application code version and the current serial number of the Control.

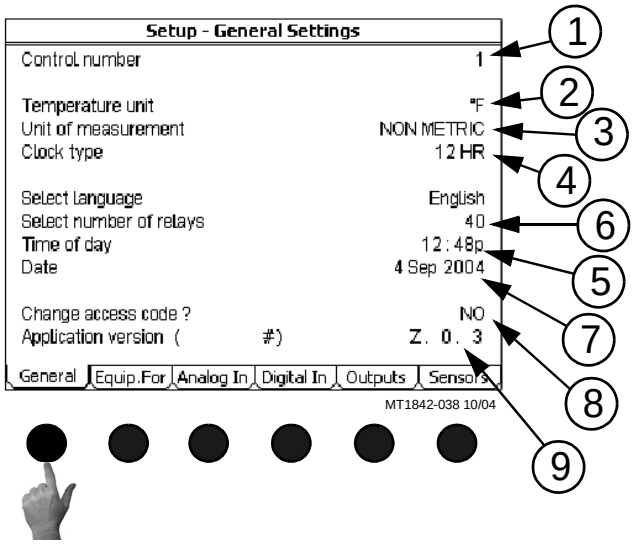


Figure 62. Setup-General Screen: General Tab

(Setup-General Screen) House Equipped For Tab

To access the Setup-General House Equipped For Screen, press the Tab Key under "Equip. For". This screen is where the Control is told what type of ventilation is being done in the house and what equipment is attached to the house. The information entered in this screen will affect what is displayed in other screens.

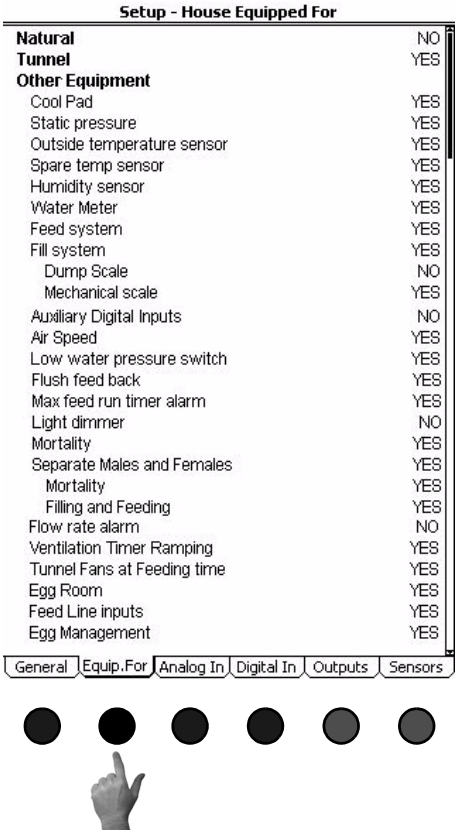


Figure 63. Setup-General Screen: House Equipped for Tab

(Setup-General Screen) Analog Inputs Tab

To access the Setup-General Analog Inputs Screen, press the Tab Key under "Analog In". In this screen the Control is told what analog Inputs (temperature sensors, relative humidity sensor, and potentiometers) are connected to the Control and where those Inputs are connected to the Control. The static pressure sensor and sensors 1-3 come from the factory pre-assigned to the IO Board Analog Inputs 1-4. All other Inputs that are connected to the Control must be assigned. It is highly recommended that the Input decal Located inside the main box of the Control be completed before entering information in this screen.

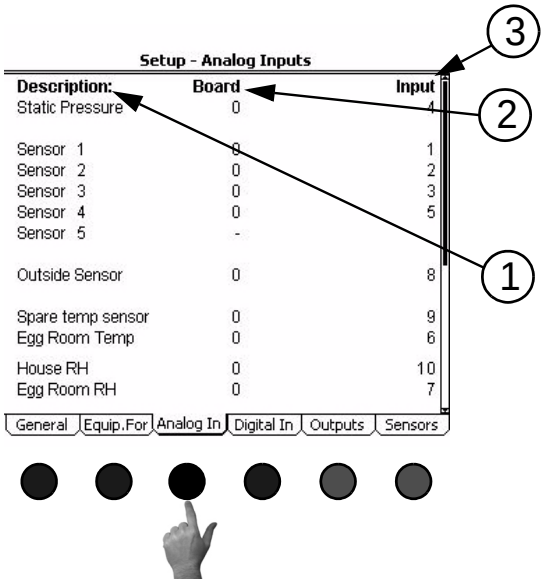


Figure 64. Setup-General: Analog In Tab

1. Description- The description is the name of the input. When a sensor is assigned to a board and an input on that board, then the next sensor number will appear in the list. For example, when sensor 4 is assigned to the IO board Analog Input #5, then sensor 5 will appear in the list as the next available sensor. If it is desired to skip a sensor and move to the next sensor in the list, enter NA (not assigned) on the sensor that needs to be skipped and the next sensor will appear in the list.
2. Board- This is the number of the board where the sensor is connected. Board number 0 is the IO Board. If the sensor is connected to an additional analog input board, then the board number matches the address of the add on board (see the installation section of this manual).
3. Input- This is the input number that the sensor is connected to on the board. For the IO Board the input number will be 1 thru 12. If the sensor is connected to an additional analog input board then the input number will be 1-4.

(Setup-General Screen) Digital Inputs Tab

Too access the Setup-General "Digital Inputs" Screen, press the Tab Key under "Digital In". This screen is very similar to the Analog Inputs screen. In this screen the Control is told what digital inputs (Water Meters, Feed Scales, Airspeed Sensor, Low Water Pressure Switch, Flush Feed Back, Auger Run Time Alarm, etc.) are connected to the Control and where those digital inputs are connected to the Control. All digital or pulsed inputs that are connected to the Control must be assigned a board number and an Input number. It is highly recommended that the Input Decal located inside the main box of the Control be completed before entering information in this screen.

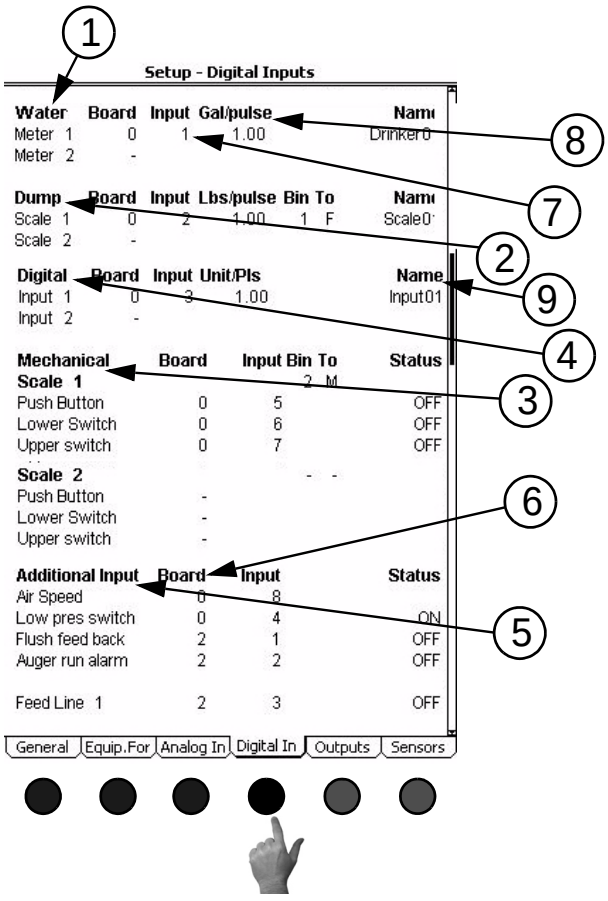


Figure 65. Setup-General Screen: Analog In Tab

1. Water Meter-All drinker water meters that are connected to the Control needs the input it is connected to assigned here. A drinker Water meter is a water meter that is monitoring the water being used by drinker water lines or the entire house (1 meter for both drinker lines and cool pads). If a water meter is assigned an input here, its daily usage will be added to the total amount of consumed water in the management screen. When a water meter or other digital input is assigned to a board and an input on that board, then the next water meter or digital input number will appear in the list. For example, when meter #1is assigned to the I/O board digital input #1, then meter #2 will appear in the list as the next available water meter. If it is desired to skip a meter or other digital input and move to the next digital input in the list, enter NA (not assigned) on the input that needs to be skipped and the next sensor will appear in the list.
2. Dump Scale- Any dump scale that is connected to the control needs the input it is connected to assigned here. The fill system that the dump scale is monitoring (female or male) must also be assigned here. If bin inventory is being tracked, the bin number (1 or 2) must be assigned here. The Control will turn off the fill system that the dump scale is assigned to when the preset amount of feed has been delivered for that day.
3. Mechanical Scale-A maximum of two mechanical scales may be connected to the control. Each mechanical scale will have three digital inputs assigned to it. The Lower switch and Push button inputs are used to start filling the weigh bin and turn the weigh bin fill system off when the desired amount of feed is reached. The Upper switch input is used to turn off the fill system going into the house once the desired amount of feed has been delivered. Each mechanical scale must have a fill system (male or female) assigned to it (in the TO column). If feed inventory is being monitored than the scale must also be assigned a bin number (1 or 2) so the appropriate amount of feed can be subtracted from the correct bin inventory.
4. Auxiliary Digital Inputs-The auxiliary digital inputs section can used to hook up many different types of digital input. Types of auxiliary Inputs include non-drinker water meters (water meters attached to evaporative cool pads, etc.), pulsed output electric meters, pulsed output gas meters, etc. Each inputs usage will be monitored separately and will not be added to any total usage.
5. Additional Digital Inputs-If an airspeed sensor, low water pressure switch, PDS flush feedback, or maximum feed run time alarm is connected to the Control, enter the proper input location here.
6. Board- This is the number of the board where the water meter or other digital input device is connected. Board number 0 is the I/O Board. If the sensor is connected to an additional digital input board, then the board number matches the address of the add on board (see the installation section of this manual).
7. Input- This is Input number that the water meter or other digital input device is connected to on the board. For the I/O Board the input number will be 1 thru 8. If the sensor is connected to an additional analog input board then the input number will be 1-4.
8. Gal/pls, Lbs/pls, units/pls-The number of gallons, pounds, etc. each pulse of the water meter, feed scale, etc. represents.
9. Name- A name can be entered for the Water meter, feed scale, and auxiliary digital inputs using the alphanumeric keypad. The name entered here will appear in the Auxiliary Data and History screens.

(Setup-General Screen) Outputs Tab

To access the Setup-General "Outputs Screen", press the Tab Key under "Outputs". Every desired output needs to have a relay assigned to it, a mode of operation (Power, Natural, Tunnel, or combinations of the three) and temperature sensor(s) assigned to it. For the Cool, Exhaust Fan, Stir Fan, Tunnel Fan and Heat Zone only one output will appear in the list at initial setup. As an output is assigned to a relay, the next output number in list will appear. For example, Tunnel Fan 1 is wired to relay #5, operating in both power and tunnel modes and is being controlled by the average temperature of sensors 1,2, and 3. Scroll through the output names to the Tun Fan output section. Tun Fan 1 will be the only tunnel fan output visible. Under the relay column enter relay #5, under the Mode column edit the line to read P T, and the Sensor Column enter sensors 1, 2, and 3. The Tun Fan 2 output should now appear. Continue assigning relays until all desired outputs have had a relay assigned to them. Verify the relay assignments with the Output Stickers on the Manual Toggle Switches.

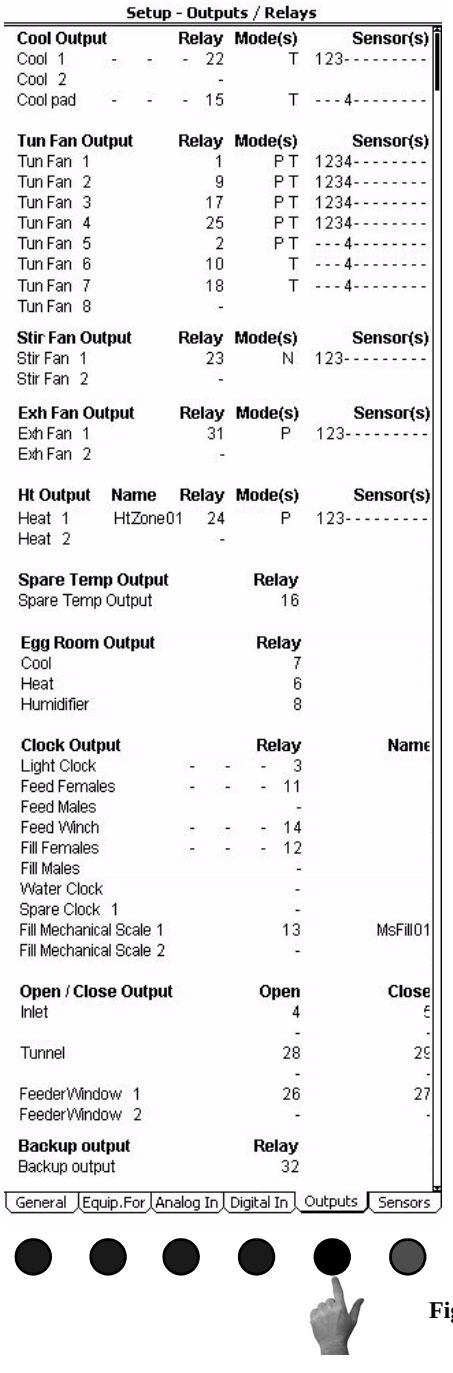

Setup - Outputs / Relays
Cool Output Relay Mode(s) Sensor(s)
Cool 1 - - - 22 T 123---------
Cool 2 -
Cool pad - - - 15 T ---4--------
Tun Fan Output Relay Mode(s) Sensor(s)
Tun Fan 1 1 P T 1234--------
Tun Fan 2 9 P T 1234--------
Tun Fan 3 17 P T 1234--------
Tun Fan 4 25 P T 1234--------
Tun Fan 5 2 P T ---4--------
Tun Fan 6 10 T ---4--------
Tun Fan 7 18 T ---4--------
Tun Fan 8 -
Stir Fan Output Relay Mode(s) Sensor(s)
Stir Fan 1 23 N 123---------
Stir Fan 2 -
Exh Fan Output Relay Mode(s) Sensor(s)
Exh Fan 1 31 P 123---------
Exh Fan 2 -
Ht Output Name Relay Mode(s) Sensor(s)
Heat 1 HtZone01 24 P 123---------
Heat 2 -
Spare Temp Output Relay
Spare Temp Output 16
Egg Room Output Relay
Cool 7
Heat 6
Humidifier 8
Clock Output Relay Name
Light Clock - - - 3
Feed Females - - - 11
Feed Males -
Feed Winch - - - 14
Fill Females - - - 12
Fill Males -
Water Clock -
Spare Clock 1 -
Fill Mechanical Scale 1 13 MsFill01
Fill Mechanical Scale 2 -
Open / Close Output Open Close
Inlet 4
-
Tunnel 28 29
-
FeederWindow 1 26 27
FeederWindow 2 -
Backup output Relay
Backup output 32
General Equip.For Analog In Digital In Outputs Sensors

Figure 66. Setup-General Screen: Outputs Tab

(Setup-General Screen) Sensors Tab

To access the Setup-General "Sensors" Screen, press the Tab Key under "Sensors". The Sensor Selection screen is where the power, natural (if used), and tunnel (if used) Mode Sensors are assigned. If Natural ventilation is used, the Temperature Sensors that control the Main Curtains and Tunnel Curtain in Natural mode are assigned here.

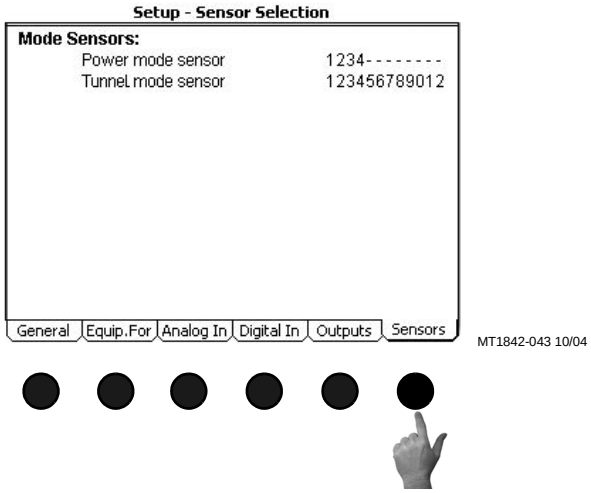


Figure 67. Setup-General Screen: Sensors Tab

Screen 14: Setup-Control

(Setup-Control Screen) Input Tab

Once all information has been entered in screen 13, Open screen 14 and press the Tab Key under "Input". In this screen, the user chooses what static pressure options to use. Answer YES for every option that is desired. For details on the functionality of the different static pressure options see the Screen 11 "Static Pressure" section of this manual.

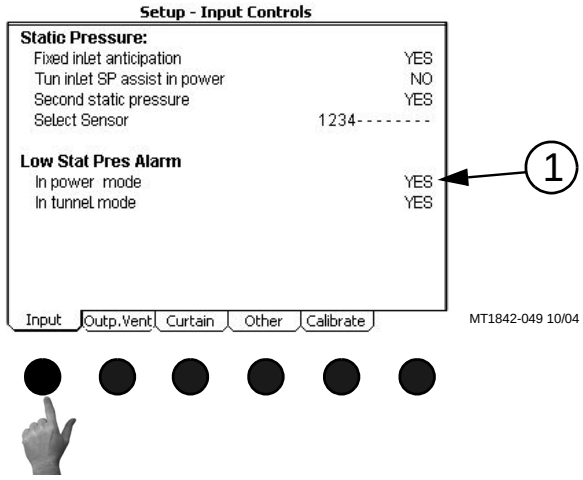


Figure 68. Setup-Control Screen: Input Tab

1. Low Static Pressure Alarm: Here it is possible to disable the low static pressure alarms in the Power mode, the Tunnel mode, or both. Answer YES for every mode that the low static pressure needs to be disabled.

Setup-Control Screen Outputs Ventilation Control Tab

To access the Setup-Control "Outputs Ventilation Control Screen, press the Tab Key under "Outp. Vent".

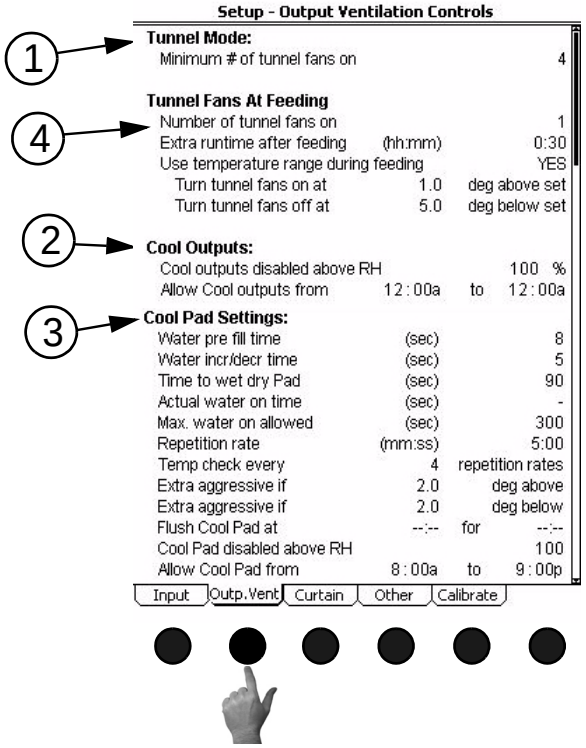

Setup - Output Ventilation Controls
1
Tunnel Mode:
Minimum # of tunnel fans on 4
Tunnel Fans At Feeding
4
Number of tunnel fans on 1
Extra runtime after feeding (hh:mm) 0:30
Use temperature range during feeding YES
Turn tunnel fans on at 1.0 deg above set
Turn tunnel fans off at 5.0 deg below set
2
Cool Outputs:
Cool outputs disabled above RH 100 %
Allow Cool outputs from 12:00a to 12:00a
3
Cool Pad Settings:
Water pre fill time (sec) 8
Water incr/decr time (sec) 5
Time to wet dry Pad (sec) 90
Actual water on time (sec) -
Max. water on allowed (sec) 300
Repetition rate (mm:ss) 5:00
Temp check every 4 repetition rates
Extra aggressive if 2.0 deg above
Extra aggressive if 2.0 deg below
Flush Cool Pad at --:-- for --:--
Cool Pad disabled above RH 100
Allow Cool Pad from 8:00a to 9:00p
Input
Outp.Vent
Curtain
Other
Calibrate

Figure 69. Setup-Control Screen: Outputs Vent. Control Tab

1. Minimum number of tunnel fans on-Enter the minimum number of fans to be running in Tunnel mode here. For further information see the Control Operation Overview section of this manual.
2. Cool Outputs-If there are relays assigned to cool output(s), and a relative humidity sensor is connected to the Control, the Control can block the cool output from turning on if the relative humidity sensor reading is higher than entered value. The user can also specify a specific time of day in which the cool outputs are allowed to operate. A setting of 12:00a to 12:00a means that the cool outputs are allowed to operated 24 hours per day.
3. Cool Pad Settings-If the optional cool pad function is used, the parameters and settings for the cool pad function are entered here. For additional information on the cool pad settings please see the Control Operation Overview section of this manual.
4. Tunnel Fans at Feeding-If it is desired to have extra Tunnel Fans turn on during feeding the settings are made here. The number of Tunnel Fans to turn on, how long to keep them on after the feeding is over and whether or not to Control the Fans on temperature during the feeding period is set here.

(Setup-Control Screen) Curtain Tab

To access the Setup-Control "Curtain Tab", press the Tab Key below "Curtain".

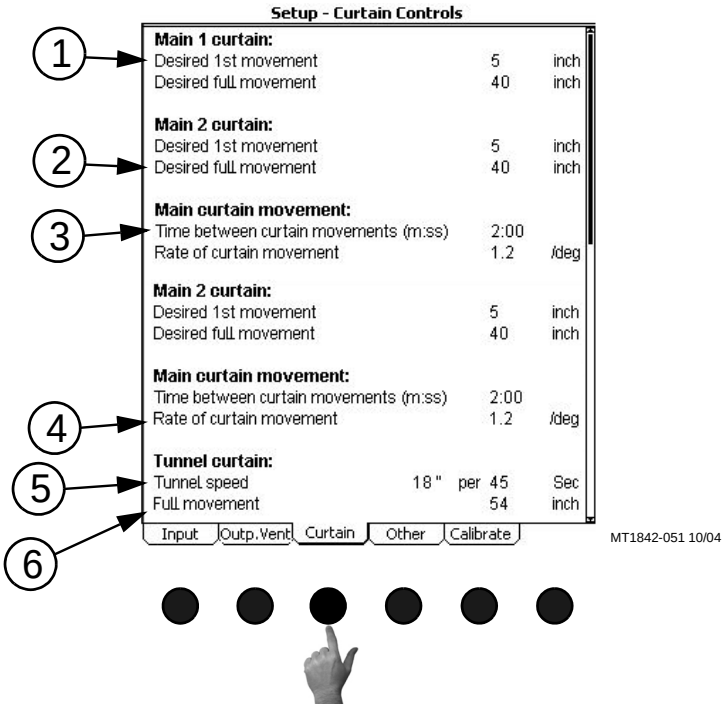


Figure 70. Setup-Control Screen: CurtainTab

1. Desired 1st movement- The amount (in inches or centimeters) the main curtain(s) should open when the Control enters the Natural mode from the Power mode.
2. Desired full movement- The desired full movement of the main curtain(s) while in Natural mode. This value can not be larger than the Mechanical full open limit which is entered in the Setup-Control: Calibration screen (Screen 14, Calibration tab).
3. Time between curtain movements- The amount of time (in minutes and seconds) the Control will wait after moving the main curtain(s) before checking to see if another curtain movement is needed (Natural mode only).
4. Rate of curtain movement- The amount the Control will open or close the main curtain(s) for every degree that the sensor is away from the average of the "Main Curtain Range." For additional information please see the Control Operation Overview section of this manual.
5. Tunnel speed- The speed of the tunnel curtain.
6. Full movement- The movement of the tunnel curtain.

(Setup-Control Screen) Other Tab

To access the Setup-Control "Curtain Tab", press the Tab Key below "Curtain".

1. Sunrise time (min)- The amount of time (in minutes) that the control will bring the light dimmer from the minimum light percentage to the maximum light percentage when the light clock reaches an ON AT time.
2. Sunset time (min)- The amount of time (in minutes) that the control will bring the light dimmer from the maximum light percentage to the minimum light percentage when the light clock reaches an OFF AT time.
3. Feed Clock uses- The Feed Clock can be set up to have an OFF AT format (curve available) or a Runtime format (no curve available). The Runtime format allows a maximum of 24 events and runtimes can be less than 1 minute.
4. Disable Feed Clock at alarm- If the Maximum Feed Runtime alarm is used, the relays assigned to the Feed Clock can be turn off if an alarm is given if this is set to YES.
5. Total feed travel time- If the Revolution feeder windows actuator is being operated by the control, then the total amount of time the actuator needs to move the windows from full open to full closed is entered here.
6. Scale Options-To automatically reset the preset amount of feed to "0", answer yes here and enter in the time of day to reset the preset. If the feedline hoppers are being pre-filled for the next day, make sure the preset is reset before the pre-fill start time.
7. Set whether the Control shows calculations per bird, per 100 birds, per 1000 birds.

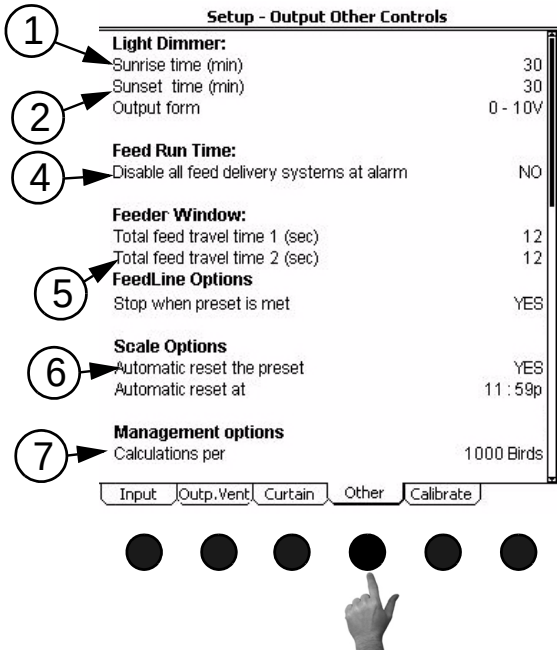


Figure 71. Setup-Control Screen: Other Tab

(Setup-Control Screen) Calibrate Analog Inputs Tab

To access the Setup-Control "Calibrate Analog Inputs Tab", press the Tab Key below "Calibrate". This screen allows the user to assign backup temperature sensors and to re-calibrate Inputs if necessary. It is strongly recommended that every sensor have a backup assigned to it. This backup sensor will take over operation if the primary sensor fails. It is recommended that the backup sensor be in the same general area as the primary sensor. As a default, every sensor is backed up by the next sensor below it. For example, sensor 6 is backed up by sensor 5.

The re-calibration section of this screen should not need to be used at initial installation and start-up of the Control unless natural ventilation is used. If natural ventilation is being used then the potentiometers will need to be calibrated at this time. If it is felt that one of the Inputs needs to be re-calibrated perform the following steps…

Temperature Sensors

To re-calibrate the Temperature Sensors, first obtain a digital thermometer that has a readout of at least .1°. **Do not use a temperature gun**. A temperature gun takes object temperatures, not air temperatures. Place the digital thermometer next to the Temperature Sensor that is being re-calibrated. Take the reading from the digital thermometer and enter that number under the temperature column, **(Item 1 Figure 72),** of the Sensor being calibrated. The Correction column, **(Item 2),** is used only for service information and to return the Control to the factory settings. The settings should be reset to factory whenever a re-calibrated Temperature Sensor is replaced. To return to factory settings change the number under the correction column by one digit.This will cause the correction to automatically zero out and return to factory setting.

Static Pressure Sensor

To re-calibrate the Static Pressure Sensor first obtain a manometer or other static pressure measuring device. Then disconnect both hoses from the Static Pressure Sensor. Go to the static pressure portion of the screen and look at the Pressure reading on the Zero Level line **(Item 3)**. If the reading is not zero then change the zero level pressure to read zero. The zero level has now been calibrated.

To calibrate the high level, first make sure that the Manometer has been installed in the house and reconnect the hoses to the Static Pressure Sensor. Open the Inlets slightly and turn on enough Fans to create a static pressure of at least 0.15 inches of w.c. at the Manometer. Compare the Manometer reading to the reading on the High Level line on the Control **(Item 4)**. If the readings do not match, edit the pressure reading on the High Level line to match the reading of the Manometer. As with the Temperature Sensors, the Correction column, **(Item 5)**, of the static pressure calibration is used for service, and to return the Control to factory settings only. This completes the re-calibration of the static pressure Sensor.

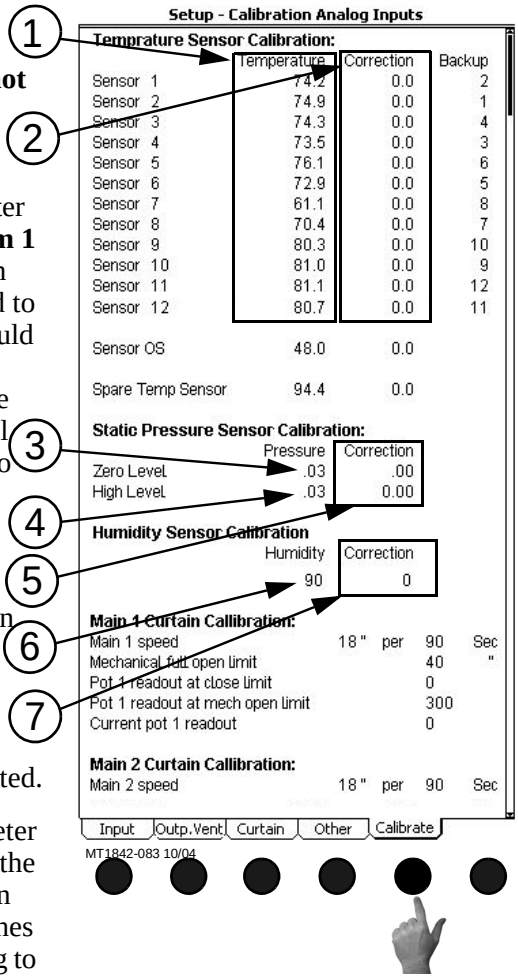


Figure 72. Setup-Control Screen: Calibrate Tab

Relative Humidity Sensor

To re calibrate the Relative Humidity Sensor first obtain a sling psychrometer or other humidity-measuring device. Operate the psychrometer in the same area that the Relative Humidity Sensor is installed. Take the reading on the psychrometer and compare it to the reading on the Setup-Control "Calibration" Screen **(Figure 72, above)**. If the readings do not match, then change the reading under the Humidity column, **(Item 6)**, to match the reading of the psychrometer. The correction column, **(Item 7)**, is to be used for service information and for returning to factory settings only.

Potentiometer Calibration (Natural Ventilation Only)

Caution! This procedure involves using the manual toggle switches for the Main Curtains open and close Outputs. Always place the open or close switch in its manual “on” position by itself. Never place both the open and close switches in the manual “on” position at the same time. This will cause the Curtain Machine to try to open and close at the same time and could cause motor or Relay failure.

To calibrate Potentiometer 1, go to the "Main 1 Curtain Calibration" portion of the calibration screen **(Figure 73, below)**.

1. Begin by measuring how long it takes the Main 1 Curtain to move 18 inches. Enter this amount time at the "Main 1 speed" line.
2. Measure the total travel distance of the Curtain from the closed limit switch to the open limit switch. Enter the number of inches at the "Mechanical full open limit" line. Return open Toggle Switch to the "off" position.

Turn the close toggle switch to manual “on” position and run the Curtain completely closed. When the Curtain is completely closed turn the toggle switch to the manual “off” position.

3. Enter the Current pot 1 readout value with Curtain completely closed at the “Pot 1 readout at close limit” line.

Turn the open toggle switch to manual “on” position and run the Curtain completely open. When the Curtain is completely open turn the toggle switch to the manual “off” position.

4. Enter the Current pot 1 readout value with the Curtain completely open at the “Pot 1 readout at mech. open limit” line.

Repeat the procedure above if Main 2 Curtain is used.

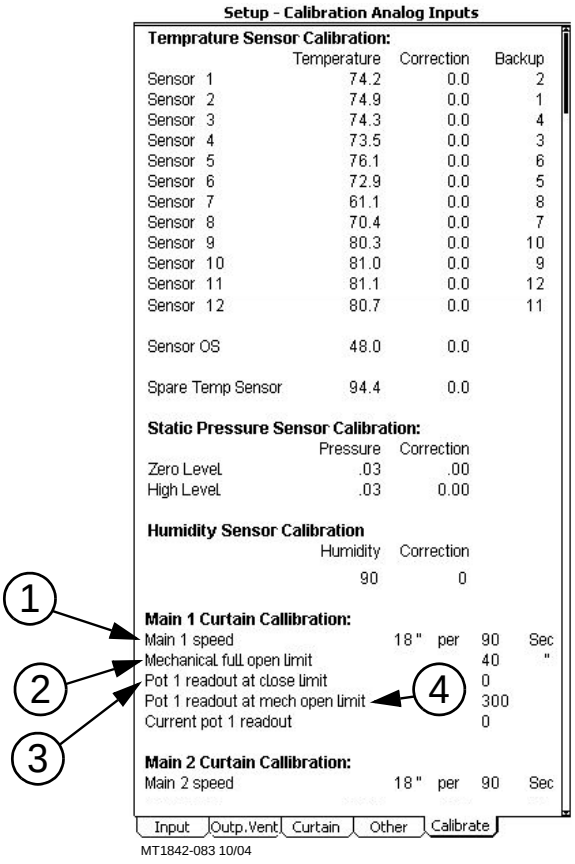


Figure 73. Setup-Control Screen: Calibrate Tab, Potentiometer Calibration

Control Operation Overview

Standard Mode Functionality

Power Mode

All curtain(s) are given a continuous close signal. Inlets are controlled by static pressure (if used). All outputs that are allowed to operate in Power Mode turn on and off per screen 4 trying satisfy their sensors assigned in Screen 13.

Natural Mode

Main Curtain Range- The Main curtain range is defined in the Outputs and Temperature screen (Screen 4) and has a default setting of + or - 1.5 degrees F of the set temperature. Once the Control has made the full transition from Power to Natural mode (or Tunnel to Natural), each main curtain's control sensor will either open or close the main curtain(s) to try to keep the sensor's temperature within the Main curtain range. If the curtain's control sensor temperature goes above the range then the curtain will open. If the curtain's control sensor temperature goes below the range then the curtain will close. The amount the curtain moves is based upon how far the curtain's control sensor(s) is from the AVERAGE of the Main curtain range. If the curtain's control sensor(s) goes more than 8 degrees F ABOVE the AVERAGE of the Main curtain range, the curtains will be given a continuous open signal until the temperature returns to within the Main curtain range. If the curtain's control sensor(s) goes more than 8 degrees F BELOW the AVERAGE of the Main curtain range the curtains will be given a continuous close signal until the temperature returns to within the Main curtain range or until the Control returns to Power Mode. The control returns to power mode when the main curtain(s) reach the first opening position (see Natural to Power Mode transition).

Time Between Curtain Movements

The Time between curtain movements is the amount of time the control will wait after an opening or closing of the main curtain(s) before checking the temperature again and doing another open or close movement. The default time between curtain movements is 2 minutes. The amount time between curtain movements can be set between 1 minute and 5 minutes. The time between curtain movements is set in Screen 14, Curtains tab.

Rate of Curtain Movement

The Rate of Curtain Movement is the amount the control will either open or close the curtain(s) during a curtain movement. The actual amount of curtain movement is calculated by taking the Rate of curtain movement and multiplying by the number of degrees the curtains control sensor is from the AVERAGE of the Main Curtain Range. For example, if the Rate of curtain movement is 1.2 inches per degree F, the AVERAGE of the Main Curtain Range is 74.0 degrees F and the curtains control sensor is reading 76.0 degrees F then the control will open the curtain 2.4 inches (1.2 x [76-74]). The default Rate of Curtain Movement is 1.2 inches per degree F and can be set between 1 in and 4 inches per degree F. The rate of curtain movement is set in Screen 14, curtains tab.

All Outputs that are allowed to operate in Natural Mode turn on and off per the Outputs and Temperatures screen (Screen 4) trying to satisfy their sensors assigned in the Setup-General screen.

Tunnel Mode

The Main curtains, if used, are given continuous close signals. The tunnel curtain is either given a continuous open signal, or is adjusted to control static pressure. The outputs that are allowed to operate in Tunnel Mode turn on and off per screen 4 trying to satisfy their temperature sensors assigned in screen 13.

Mode Transitions

There are six possible mode transitions:

1.Power to Natural

2.Power to Tunnel

3.Natural to Power

4.Natural to Tunnel

5.Tunnel to Natural

6.Tunnel to Power

The sequences of events that happen for each transition are very different and deal with the various considerations that must be dealt with in order to safely get from one mode to another.

Power to Natural

In the Power mode, the main and tunnel curtains are given a continuous close signal. When the Power mode sensor(s) reach the Natural Allowed temperature in Screen 4, the main and tunnel curtains will open for the amount of time required for the first opening movement defined in Screen 14, curtains tab. The control calculates this amount of time based on the speed specified in Screen 14, curtains tab for each curtain (Main 1, Main 2, and Tunnel).

If the temperature drops 0.6 degrees F, within the first two minutes after the curtain(s) reach the desired first opening, the control will immediately close all the curtains and return to Power mode. This is known as the "fast temperature drop test". If the temperature does not drop this fast, the control will proceed with normal natural operation (see previous section).

Natural to Power

The natural to power transition occurs when the Main Curtain returns to it’s “first opening” position, while going closed. If there are two Main Curtains, (Main1 and Main2), the transition occurs as soon as both Curtains are at or past their first opening positions in the process of going closed. The temperature must be below the Main Curtain Range for the curtain(s) to move in the close direction, but temperature by itself does not cause the transition from Natural to Power Mode. The Fans that are called for to be on in the Power Mode are delayed from coming on until the Main Curtain(s) have enough time to get closed. The Tunnel Curtain is given a continuous close signal during the entire Natural to Power transition. Heat zone outputs are disabled for an additional 2 minutes to minimize fuel waste while the temperatures stabilize after the transition is over.

Natural to Tunnel

The Natural to Tunnel transition occurs when the Natural Mode Sensor reaches the temperature in screen 3 for Tunnel to be “on”. The Main Curtain(s) are given a continuous close signal as the Tunnel Curtain is given an open signal that lasts enough time to reach the half open position if the Tunnel Curtain is set up to control static pressure, or else continuously open if the Tunnel Curtain is not set up to control static pressure. While the Main Curtains are going closed and they reach the desired first opening position , the Tunnel Fans turn on that are called for to be on. The Main Curtains are given a continuous close signal as the Control continues in the Tunnel Mode.

Tunnel to Natural

The Tunnel to Natural transition occurs when the Tunnel Mode Sensor drops to the temperature in screen 3 for tunnel to be “off”. The Tunnel Fans that are running turn off and the Main Curtains are given continuous open signals for the amount of time required to completely open the Main Curtains. At that point, the Control proceeds with the normal Natural Mode operation, opening and closing the Main and Tunnel Curtains depending on how far each Curtain’s assigned Sensor(s) are from the Main Curtain Range.

Tunnel to Power

The Tunnel to Power Mode transition occurs when the Tunnel Mode Sensor drops to the temperature in screen 3 for Tunnel to be “off” and Natural Mode is either “not allowed” in screen 3 or not even a part of the installation in screen 12. The Fans that are called for to be on due to being in the Power Mode turn on immediately as the Fans that have been on because of Tunnel Mode turn off. Similar to the Power to Tunnel transition, several or even all of the Fans that were on in Tunnel, just prior to the transition, may stay on after the full transition to Power depending on the way the Control is set up. The Side-wall Air Inlets are given a full open signal during the transition. The Sidewall Inlets begin to control static pressure once the transition is completed.

Minimum # of Tunnel Fans On

In screen 12 the “Minimum number of Tunnel Fans on” is set up. This puts a limit on the temperature rise from one end of the house to the other while in Tunnel Mode. As the animals grow this "Minimum number of Fans" value should normally be increased. This parameter has no effect on how many Fans are on in the Power Mode just prior to the transition to Tunnel. The temperature settings set up in screen 3 determine the number of Fans that operate while still in the Power Mode before making the transition from Power to Tunnel.

The actual “TUN FAN” outputs that make up this min. group of Fans are those "Tun Fans" that have the lowest temp. settings in screen 3. If more than one “TUN FAN” output is set at the same temperature in screen 3, the Control will arbitrarily pick enough of those TUN FANS to add up to the minimum # specified in screen 12.

Cool Pad Function

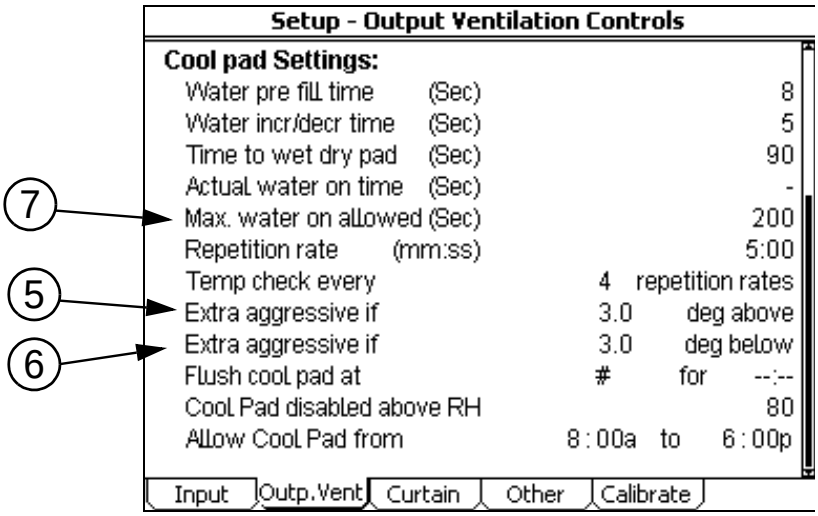

Setup - Output Ventilation Controls
Cool pad Settings:
Water pre fill time (Sec) 8
Water incr/decr time (Sec) 5
Time to wet dry pad (Sec) 90
Actual water on time (Sec) -
Max. water on allowed (Sec) 200
Repetition rate (mm:ss) 5:00
Temp check every 4 repetition rates
Extra aggressive if 3.0 deg above
Extra aggressive if 3.0 deg below
Flush cool pad at # for --:--
Cool Pad disabled above RH 80
Allow Cool Pad from 8:00a to 6:00p
Input
Outp.Vent
Curtain
Other
Calibrate
7
5
6

Figure 74. Cool Pad Function

The COOL PAD output is very different from a COOL output. It is not intended that the COOL PAD output and the COOL output would be used together, but it is possible. Both outputs are there to give the user the choice on which type of output to use. The COOL PAD's relay operation is designed to begin the cooling caused by the cooling pad by first adding 5 seconds of water to the pad every 5 minutes. If the temperature is still with the "Cool Pad Range" after 4 doses of 5 seconds of water, the amount of water added to the pad every 5 minutes remains the same. If the temperature is above or below the temperature limits of the "Cool Pad Range", the amount of water "on" time each 5 minutes is increased or decreased 5 seconds. With the default settings the temperature is only checked every 20 minutes. If it is desired for the temperature to be checked more often if a sudden large temperature change occurs, then values should be entered in the "Extra aggressive if" lines **(Items 5 and 6, Figure 74)**. For example, The Control is set to be extra aggressive if 3.0 degrees above the upper limit of the COOL PAD range. Whenever the temperature is more than 3.0 degrees above the upper limit of the COOL PAD range the Control will begin checking the temperature every 5 minutes (every repetition rate) instead of every 20 minutes (every 4 repetition rates) until the temperature returns to less than 3.0 degrees above the COOL PAD range. The default extra aggressive settings are 3 degrees.

On a very hot day it would be possible for the water to be running continuously and the temperature to be in the "Cool Pad Range". A more moderate day might result in the water running a very small amount of time in order to keep the temperature within the "Cool Pad Range". Similarly, on a low humidity day the amount of water required to keep the temperature within the "Cool Pad Range" would be less than for a high humidity day. The Control will adjust the water as required to keep the temperature in the "Cool Pad Range". If it is desired to not allow the water to run continuously, then the Max water allowed **(Item 7, Figure 74)** value should be changed so that it is less than the repetition rate value.

Cool Pad Function Continued.....

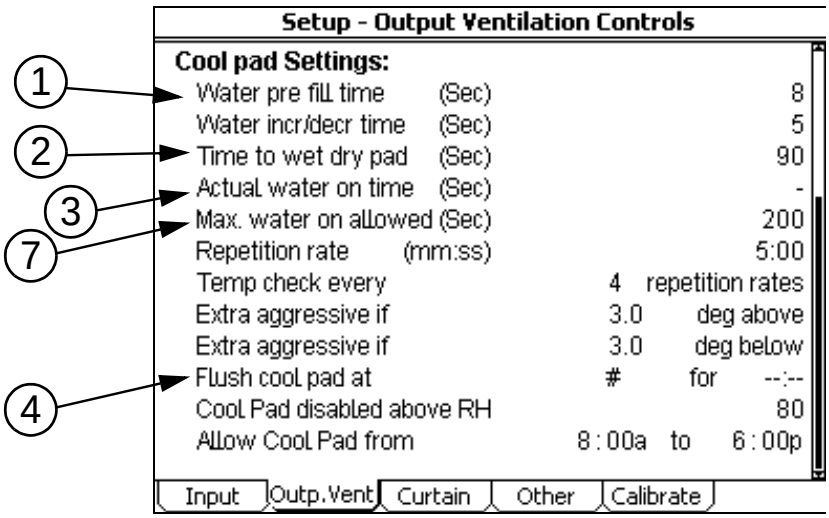


Figure 75. Cool Pad Function (continued)

The parameters that determine exactly how the COOL PAD function reacts are programmed in the Setup-Control, Ventilation Outputs screen (Screen 14, Outputs Vent tab). Chore-Time strongly recommends that the factory default settings be used, unless poor control of temperature during pad operation is noticed. Chore-Time also recommends that CTB service personnel is contacted before changing the settings.

Measure the number of seconds it takes for water to start coming out of the holes in the pad system's top distribution pipe after turning on the COOL PAD manual toggle switch. This should be entered as the "Water pre-fill time" **(Item 1, Figure 75)** and is likely to be different for the different system manufacturers. This amount of time is added to the water run time each repetition because the top distribution pipe drains out during the off time of the on-off cycle.

Measure the number of seconds it takes for water to start dripping out the bottom of a dry pad after the COOL PAD manual toggle switch is turned to the on position. This amount of time should be entered as the "Time to wet dry pad" **(Item 2, Figure 75)**. This will be less than the time to make the pad completely soaked. When the actual water on time reaches this "Time to wet dry pad" value, the next step is to run the water continuously, assuming that the temperature is above the Cool Pad Range at the next temperature check point. If water running on the pad continuously is not desired, then the "Max water allowed" value **(Item 7, Figure 72)** should be changed so that it is less than the repetition rate time. Once the temperature decreases back below the Cool Pad Range, the actual water on time will return to the "Time to wet dry pad" value again. From there the water on time changes in the normal way, with 5 second changes every 20 minutes, depending on the temperature check points.

The "Actual water on time", **(Item 3, Figure 75)** is for information only. Showing the value makes it possible to create a graph of it's variations if you have the PC connection (C-Central).

The "Flush cool pad", **(Item 4, Figure 75)** is a feature that allows you to run the water continuously at a time of day each day for the duration you specify. This will guarantee that at least once a day the pad will be flushed to keep it as clean as possible and help lengthen the pad life. Leaving dashes for the settings disables this feature. Flushing the pad in the night will have the advantage of causing very little unwanted temperature drop.

Curves

The clocks, Set temperature, Minimum ventilation timer and the Revolution feeder window can be curved, if desired. This means that the settings for these parameters can be automatically changed by the Control. The "bend points" (BP) of the curves are the day numbers (age of birds, for instance) combined with the desired values of the settings at those day numbers. In the case of the feed and light clock curves, and the feeder window ramp, the settings stay the same from one bend point to the next bend point. For the set temperature and minimum ventilation timer curves, the Control adjusts the settings gradually between the bend points.

When the curves are turned "on", the Control will refer to the curve values and automatically adjust the settings to the curve value beginning at midnight of BP1's day number. Negative day numbers are allowed (Max=-7, Day number 0 does not exist). Day 1 would normally be the day the birds are placed.

Mechanical Scale

Filling the Weigh bin: To weigh using the mechanical scale, first slide the weigh bar to the desired amount of feed to be put into the weigh bin. The balance beam should make contract with the lower switch in the scale system. Then press and hold the push button switch for 3 seconds. The weigh bin fill system should turn on and run until the balance breaks contact with the lower switch.

Emptying the Weigh Bin (feeding the birds): To set the weigh bin up for feeding, first slide the weigh bar back to 0 or the desired amount of feed to be delivered into the house. This should cause the balance beam to make contact with the upper switch in the scale system. When the fill system (male or female) reaches the next start time, the fill system will start and run for the programmed amount of time, or until the balance beam breaks contact with the upper switch (whichever comes first). Once the balance beam has broken contact with the upper switch, the fill system will not be allowed to run again until the preset has been reset.

Dump Scale

Delivering feed to the house- When using a Dump Scale to measure feed, the Control will start the fill system (male or female) at the next programmed start time. The fill system will continue to run until the desired run time is reached or the Dump Scale has had the preset amount of feed run through it (whichever comes first). Once the preset amount of feed has run through the dump scale, the control will not allow the fill system to run again until the preset has been reset.

Alarms

At the top of the "Alarm Overview" (Screen 8, Alarm Conditions tab) screen, the current status of the alarm system will be shown. The three possible statuses are ENABLED, DISABLED, AND TEST. The status field can be changed.

Enabled

If the alarm system is ENABLED and one or more alarms arise, there will be alarm message(s) at the top of "Alarm Commands" screen. After pressing the Alarm button the first time, the alarm Relay will be changed to the non alarm state for one minute and the alarm-screen will be shown. By pressing the Alarm button a second time the alarm message will change from ALARM to the status NOTICED. This second button press is the manner that you tell the Control that you are aware of the alarm condition and, in so doing, NOTICE the alarm condition. If there is more than one alarm condition, you NOTICE each additional alarm condition with an additional button press for each additional alarm condition. If you fail to NOTICE an alarm with the additional button press(s), the alarm Relay will return to the alarm state one

minute after the initial Alarm button press. If the alarm condition is still present when you NOTICE the alarm, the word ALARM to the right of the condition will (for most alarm conditions) change to OFF FOR 24:00. The time setting is editable. It gives you time to deal with the problem. If you do not fix the problem, the alarm Relay will once again trigger your alarm system at the end of the time period. If the alarm condition has RECOVERED by the time you NOTICE the condition, the alarm message disappears when you NOTICE it and it is added to the "Alarm History" screen.

Disabled

It is possible, but not recommended, to DISABLE the alarm system of the Control. One reason for this could be that the house is empty. The light beside the the Alarm button will flash slowly to remind you that the alarm system is disabled, but the alarm Relay will not change to the alarm state. The alarm history shown at the bottom of the "Alarm History" screen does list that the alarm system was disabled, when, and for how long.

Test

If the user chooses TEST, the alarm Relay will immediately change to the alarm state. This allows testing the alarm system that is external to the Control (telephone dialer, for instance.) NOTICING the ALARM TEST, as you would a normal alarm, erases the alarm message and returns the alarm Relay to the non alarm state. Also, an ALARM TEST notification will be listed in the alarm history. Any current alarm condition(s) will be shown below the current system status in the "Alarm Overview" (Screen 8, Alarm Conditions tab).

Warning

There also is an alarm message status called WARNING. This does not change the state of the alarm Relay, but alerts you that something isn’t right. It needs to be NOTICED in the same way as a “hard” alarm in order to turn off the flashing lights, etc. An example is a failed Sensor.

Alarm History

In the "Alarm History" screen is a listing of the most recent 20 alarms. The date and time of each alarm is shown. The amount of time elapsed (hh:mm) from the time the alarm occurs until the alarm is noticed and recovers is also show.

Alarm Messages

Sensor Failure

If a Sensor that is assigned (used) for any purpose gets below 0 °F or above 120 °F for 1 minute, a silent alarm (WARNING) will be given. The temperature of the backup Sensor defined in the "Setup" screen will be used while the failed Sensor situation exists. If there are multiple, concurrent Sensor failures such that it is impossible for the Control to determine a temperature or temperature average that is needed, a loud alarm will be given (the alarm Relay changes to the alarm state). At the same time, the Relay(s) using the failed Sensors turn off. If Mode Sensors are involved, the current mode will not change as long as the alarm condition exists. When an average of Sensors is involved, all of those Sensors, plus the backup Sensor for each Sensor used in that average, would have to fail in order to result in a hard alarm.

Min / Max Rel Sensor #

The Minimum and Maximum Relative Temperature Alarm limits refer to the set temperature. A +10.0 maximum relative alarm means that one or more of the Sensors that are a part of the current mode's Control Sensor get to be greater than 10 degrees higher than the set temperature. The alarm message indicates which of the Sensors is outside the limits. Between the parentheses to the right of the Min and Max Relative Alarm limits are the resulting actual temperature limits. They are simply the addition or subtraction of the limit to or from the current set temperature. A "min" and a "max temp alarm" setting can be entered for all three modes of ventilation.

No Sensor Available

When a temperature sensor and its assigned Backup Sensor fail then a "No Sensor Available" loud alarm will be given. This alarm will not recover by itself and must be cleared by the user.

Pressure Alarm Min / Max

The Static Pressure Alarm limits are only considered by the software when a Fan or Fans is running or would be running if the toggle switch(s) were in the automatic position.

For the Static Pressure Alarm to occur, the static pressure has to be outside of the Alarm Limits for 1 minute of accumulated Fan run time. Any reading within the alarm limits while a Fan or Fans are running resets the accumulated run time to zero. For the case where the only Fans running are cycling with a Timer, it can take more than one cycle of the Timer for the alarm to happen. This is true when the "on" time of the Timer is less than 1 minute. The "off" time of the Timer does not add to the accumulated "on" time.

Pressure Failure

If the pressure measurement gets outside of the Static Pressure range of -.05 to 0.40 continuously for 1 minute, regardless of the Fans on/off status, a static pressure failure alarm will happen. The Inlets will be given continuous open signals if this occurs.

Low Water Pressure

An optional mechanical water pressure switch can be attached to the left 2 terminals of the D2 input to the I/O board in order to detect a low water pressure condition. The switch contacts need to be closed when the pressure is above a safe lower limit. In the "Setup" screen you can program an alarm delay time in order to screen out transient low water pressure conditions. The Low Pressure Switch alarm is set at the factory to come on at 5 PSI and goes back off when the pressure rises above 10 PSI.

Program # Activated

Activating a program in the "Programs" screen does not represent a hazard, but it is very helpful to evaluate where you have been in terms of the program(s) used. The alarm history shows activity of program activation. The alarm light will flash, and when you NOTICE the alarm message, it will disappear to the alarm history. The Alarm Relay does not change to the alarm state.

Pot # Not Responding (Natural ventilation only)

This alarm is generated whenever 2 minutes of open or close time does not

result in at least 10 counts of change to the pot readout. Changing direction resets the 2 minute Timer. This alarm is also generated if there are 10 or fewer counts to the pot readout during the first opening transition. The 2 minute Timer does not advance and is reset to zero whenever the pot readout is within 10% of either calibration limit.

Pot # Outside Limits (Natural ventilation only)

This alarm is generated whenever the pot readout is more than 10% past the calibration limit at either end.

Listed below are additional alarm codes that relate to the internal operation of the Control. Contact Agile Manufacturing service personnel, if any of these alarms occur.

Min/Max Spare Sensor Alarm

If the optional Spare Temperature sensor is connected to the Control, then a Maximum and Minimum temperature alarm can be defined for this sensor. The alarm temperature setting is an absolute temperature (The actual desired alarm temperature is entered, as opposed to being relative to set temperature). The alarm occurs when the spare temperature sensor reaches the alarm temperature setting and remains at or beyond that temperature for one minute.

Low Water Flow Alarm

If a water meter(s) is connected to a digital input of the Control, then the Control can be set to detect low water flow and activate the alarm relay. If the water flowing through the water meter(s) falls below the gallons (liters) per hour set in the Alarm Settings screen (Screen 8 alarms settings tab) for longer than the amount of delay time set in the Alarm Settings screen, then the alarm relay will be activated. The alarm recovers when the water flow returns above the low water flow setting. The low water flow alarm can be disabled during the light clocks OFF time, or can be set to be inactive during a particular time of day. This temporary disabling of the low water flow alarm is set in the Setup-Control, Other screen. The Low water flow alarm option must be answered YES in the Setup-General: House equipped for screen (Screen 13, Equipped For tab).

High Water Flow

If a water meter(s) is connected to a digital input of the Control, then the Control can be set to detect high water flow and activate the alarm relay. If the water flowing through the water meter(s) goes above the gallons (liters) per hour set in the Alarm Settings screen (Screen 8 alarms settings tab) for longer than the amount of delay time set in the Alarm Settings screen, then the alarm relay will be activated. The alarm recovers when the water flow returns below the high water flow setting. The High water flow alarm option must be answered YES in the Setup-General: House equipped for screen (Screen 13, Equipped For tab).

Max Feed Runtime Alarm

If a dry contact relay whose coil is energized when the fill system's hopper level switch calls for the fill system to run is connected to a digital input of the Control, then the Control can be set to detect excessive fill system run time and activate the alarm relay. The alarm is activated when the digital input assigned to the Max Feed runtime alarm is closed for longer than the time entered in the Alarm Setting screen (Screen 8, settings tab). The Control can shut off the relays that are assigned to the feed clock when the Max feed run time alarm occurs. These relays will not turn on again until the user has noticed the alarm. The Max Feed Runtime Alarm option must be answered YES in the Setup-General: House equipped for screen (Screen 13, Equipped

For tab) The option of turning off the Feed Clock relays during a Max Feed run time alarm is set in the Setup-Control: Other screen (Screen 14, Other tab).

IOnet ALARM

An IOnet Alarm will occur when the Control can not communicate with one or more of the Manual Switch Boards. The alarm relay will stay energized until the alarm is noticed. If the IOnet alarm condition has been corrected then the alarm status will return to normal. If the IOnet alarm condition has not been corrected the IOnet alarm will appear again after being noticed. See the trouble shooting section of this manual for more information on correcting IOnet Alarms.

Min/Max Rel Sensor #

The Minimum and Maximum Relative Temperature Alarm Limits refer to the set temperature. A +10.0 maximum relative alarm means that one or more of the temperature sensors that are being monitored in the current mode (default is the mode sensors) are greater than 10 degrees higher than the set temperature. The alarm message indicates in which mode the alarm occurred and which sensor went outside of the limits. Between the parentheses to the right of the Min and Max Relative Alarm limits are the resulting actual temperature limits. They are the addition or subtraction of the limit to or from the current set temperature. A "min" and a "max" temp alarm setting can be entered for all three modes of ventilation.

Low Water Pressure

An optional mechanical water pressure switch can be connected to one of the digital inputs of the IO board in order to detect a low water pressure condition. The switch contacts need to be closed when the pressure is above a safe lower limit. In the Alarm Settings screen (Screen 8, settings tab), the amount of alarm delay time can be entered in order to filter out transient low water pressure conditions. The low water pressure alarm switch is set at the factory to come on at 5 PSI and goes back off when the pressure rises above 10 PSI.

Max/Min Hum Egg RH

The maximum and minimum Egg Room Humidity Alarm refer to the set humidity of the egg room. A +10 maximum relative alarm means that the relative humidity sensor in the egg room is reading a relative humidity level of more than 10 percent in the Egg Room. Since this setting is based on the set humidity of the egg room, the alarm limit will change when set humidity is changed.

Sensor Failure Egg RH

This alarm will appear if the Egg room relative humidity sensor is reading out of range for 1 minute. This is a hard alarm and will not clear until the sensor is reading within the range.

Females (or Males) Fill Not Met

This warning message will appear when the control shows that the correct amount of feed has not been delivered to the house at the time the Preset is reset.

Mechanical Scale: If the weigh beam has not broken contact with the upper switch of the scale system when the preset is reset, this warning message will appear.

Dump Scale: If the preset amount of feed has not gone through the dump scale at the time the preset is reset, this alarm message will appear.

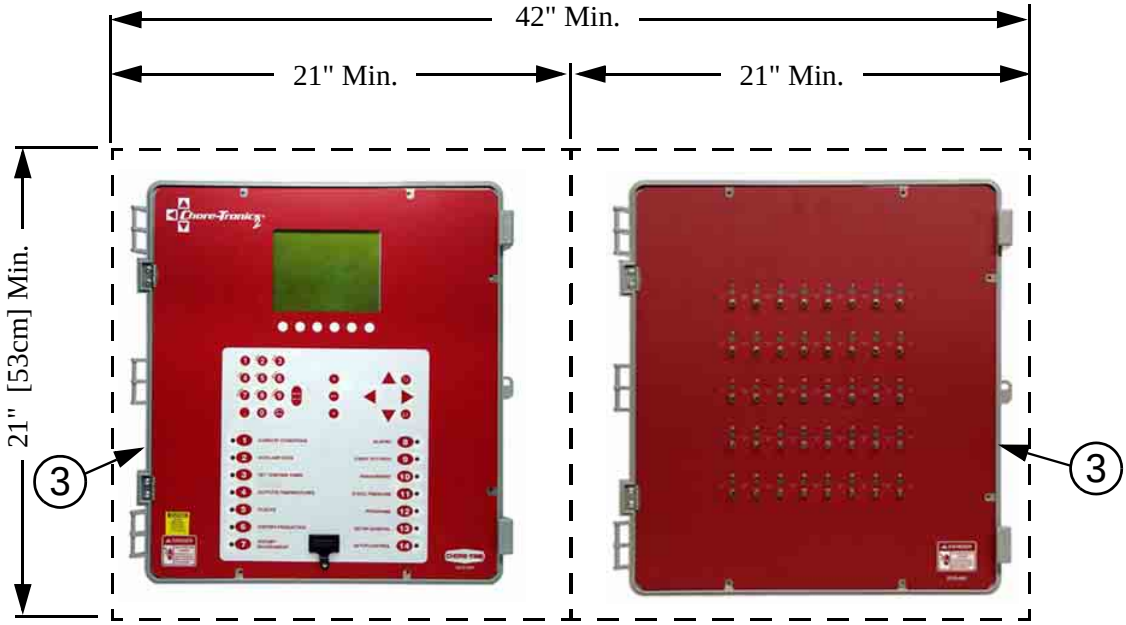
Control Installation

Mounting the Control

32 and 40 Output Control Mounting

A 32 or 40 Output Chore-Tronics® 2 Control consists of a Main Box and a Relay Box. The Main Box and the Relay box each requires a minimum mounting area of 21 in. [53 cm] x 21 in. [53 cm] **(See Figure 76)**.This dimension allows extra room for the control doors to open. The boxes should be mounted level and square on a solid backing using the mounting holes provided.

Note: When mounting the Main Box and the Relay Box, make sure the two boxes are as close together as possible to reduce the likely hood of a communication failure. Make sure that the Relay Box is mounted so that the relay indicator lights are visible when standing at the Main Box.

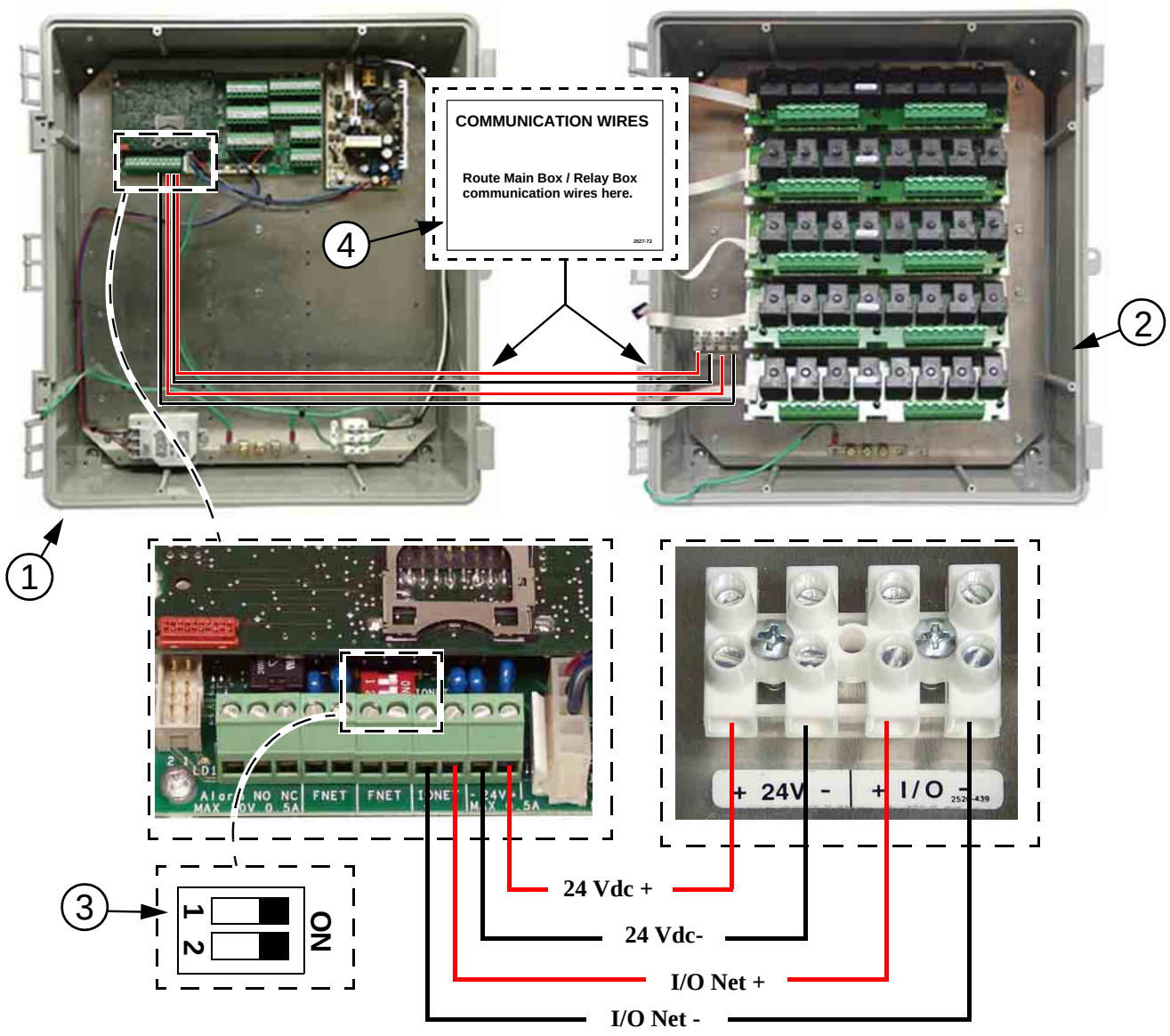


Item	Description
1	Main Box
2	Relay Box

Figure 76. 32 and 40 Output Control Mounting

Warning! **Do Not run I/O Net or 24 Vdc Twisted Pair wire close to and/or parallel with line voltage wires. (See Figure 78)**

The I/O Net terminals of the Main Box and the Relay box must be connected together using the Non-Shielded Twisted Pair Wire (Chore Time Part no. 42208) included within the Main Box. There is a Decal **(Figure 77, Item 4)** on the Main Box as well as the Relay Box showing the location to route the I/O Net wires (Communication Wires). I/O Net is polarity sensitive so be sure that the positive and negative I/O Net terminals of both the Main Box and the Relay Box are connected properly **(See Figure 77)**. Make sure that DIP switch #1 on the I/O Board is in the ON position. The 24 Vdc must also be connected from the Main Box to the Relay Box using the Twisted Pair wire included within the Main Box. Route the wires along with the I/O Net Wires according to the Communication Wire Decals **(Item 4)** on the Boxes.



Item	Description
1	Main Box
2	Relay Box
3	Dip Switch 1 (In On Position)
4	I/O Net and 24Vdc Wire Routing Decal (Communication Wire)

Figure 77. I/O Net and 24Vdc Wiring (Communication Wire)

Caution: Do NOT run 24 Vdc and I/O Net wire close to and/or parallel with line (120 Vac or greater) voltage wires. Doing so can cause operational failure in the Control and will void Warranty. If 24 Vdc or I/O Net wires need to cross line voltage wires make sure the wires cross at a 90 degree angle. Also, no other electrical devices such as transformers, light dimmers, additional relays, etc. should be mounted inside the Main Box or near the 24 Vdc power or I/O Net wires.

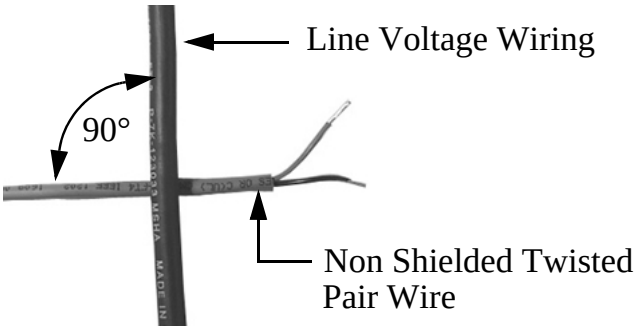
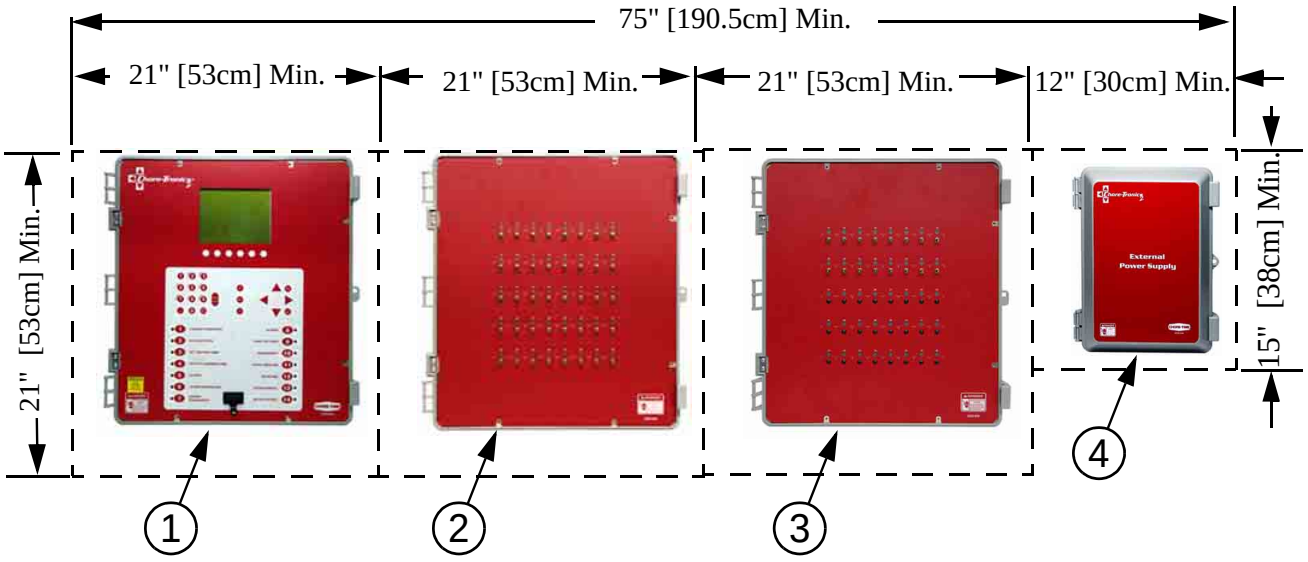


Figure 78. 90° Crossover

56 Output Controls

A 56 Output Chore-Tronics® 2 Control consists of a Main Box, *two* Relay Boxes, and an External Power Supply for the Second Relay Box. The Main Box and the Relay Box/s Each require a space of 21 in. [53 cm] x 21 in. [53 cm]. The External Power Supply requires 12" [30cm] x 15" [38cm]. These dimensions allow extra room for the Control doors to open. The boxes should be mounted level and square on a solid backing using the mounting holes provided.

Note: When mounting the Main Box and the two Relay Boxes, make sure that the boxes are mounted as close together as possible to reduce the likely hood of a communication failure. Make sure that the Relay Boxes are mounted so that the relay indicator lights are visible when standing at the Main Box. **(See Figure 76)**

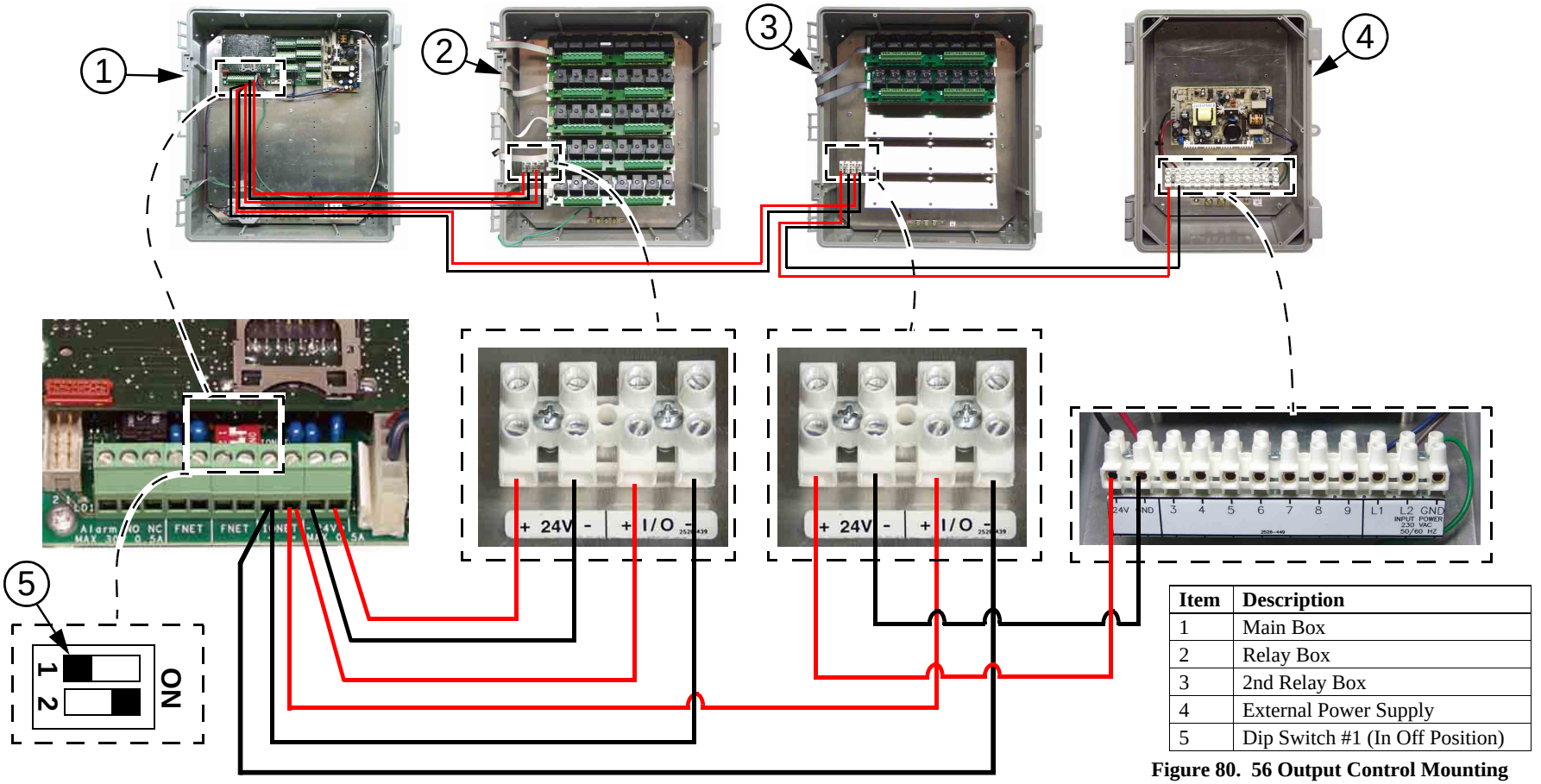


Item	Description
1	Main Box
2	Relay Box
3	2nd Relay Box
4	External Power Supply

Figure 79. 56 Output Control Mounting

The I/O Net terminals of the Main box and the two Relay Boxes must be connected using Non-shielded Twisted Pair Wire (Chore-Time part no. 42208). Using the Twisted Pair Wire provided, hook the I/O Net wires from the first Relay Box to the Main Box, then from the Main Box to the Second Relay Box. I/O Net is polarity sensitive so be sure that the positive and negative I/O Net terminals in all boxes are connected properly **(Figure 80)**. Also make sure that DIP switch #1 on the IO board of the Main Box is in the OFF position. 24 Vdc must be connected from the Main Box to the first Relay Box (relays 1-40) using the Twisted Pair Wire provided. The 24 Vdc for the Second Relay Box (relays 41-56) must be connected to the External Power Supply **(See Figure 80).**

Important! **The supply voltage for the External Power Supply needs to come from the same breaker as the Main Box**.



Item	Description
1	Main Box
2	Relay Box
3	2nd Relay Box
4	External Power Supply
5	Dip Switch #1 (In Off Position)

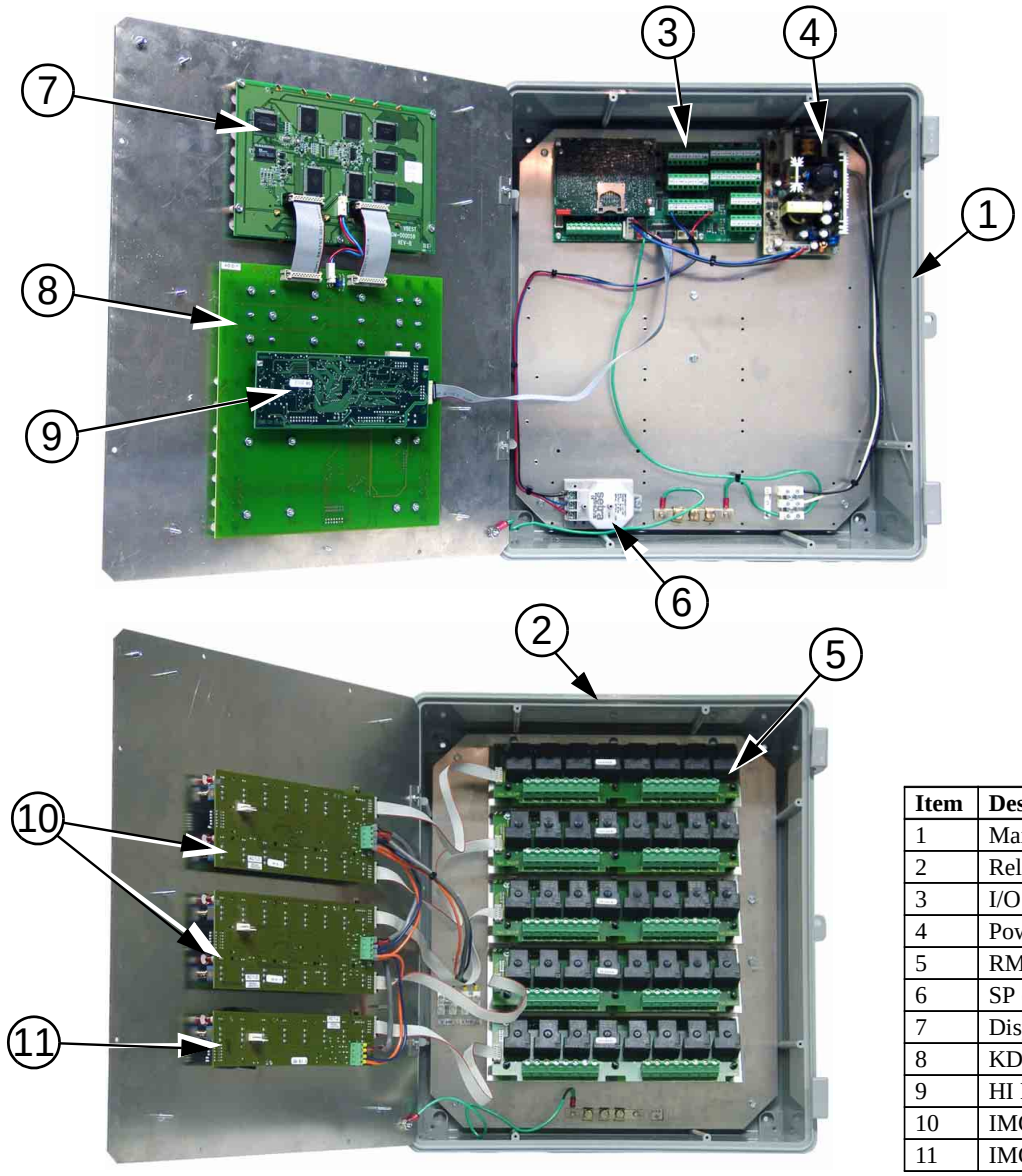
Figure 80. 56 Output Control Mounting

Caution: Do NOT run 24 Vdc and I/O Net wire close to and/or parallel with line (120 Vac or greater) wires. Doing so can cause operational failure in the Control and Void Warranty. If 24 Vdc or I/O Net wires need to cross line voltage wires make sure the wires cross at a 90 degree angle **(See Figure 78)**. Also, no other electrical devices such as transformers, light dimmers, additional relays, etc. should be mounted inside the main box or near the 24 Vdc power or I/O Net wires.

Wiring the Control

Note **As with all electronic controls, we recommend the use of a backup system. This will provide continuous operation in the unlikely event of Control failure. Use the current Back Up Box Manual for wiring instructions.**

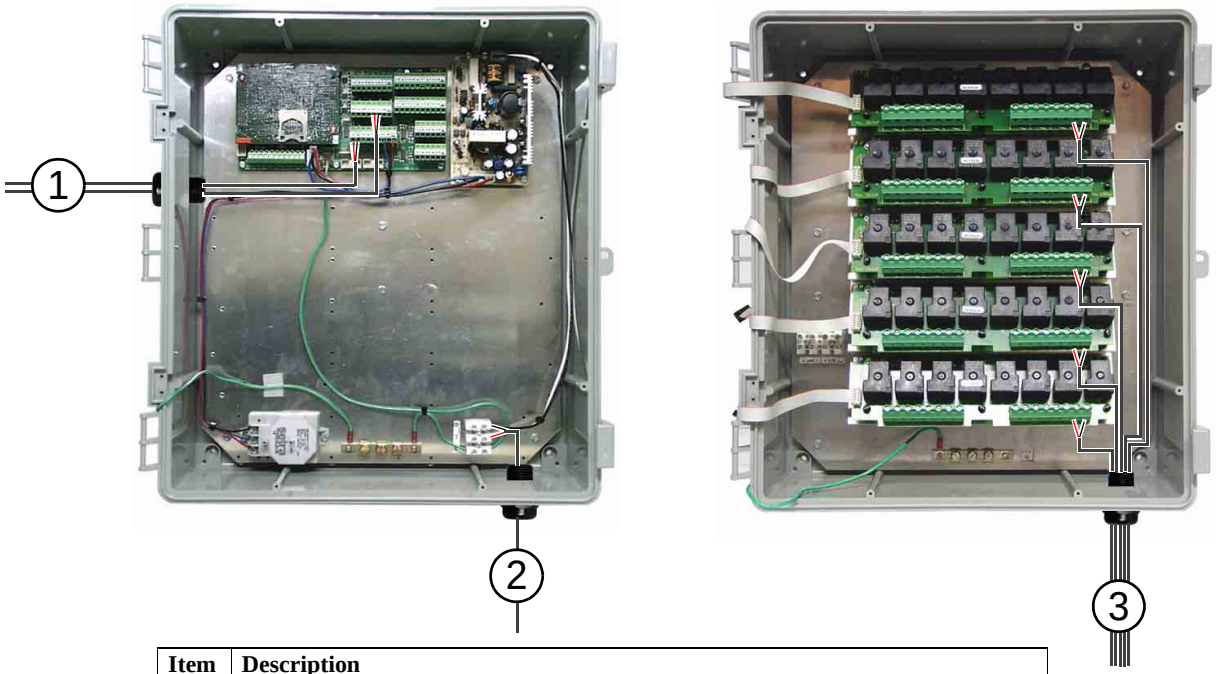
The Chore-Tronics® 2 Controls consist of several different types of boards shown in **Figure 81**. The two Boards involved in wiring the Controls are the I/O Board and the Relay Module (RM Board).



Item	Description
1	Main Box
2	Relay Box
3	I/O Board
4	Power Supply
5	RM Board (Relay Module)
6	SP (Static Pressure) Sensor
7	Display Board
8	KD Board
9	HI Basic Board
10	IMCM.16 Board
11	IMCM.8 Board

Figure 81. Wiring/Boards

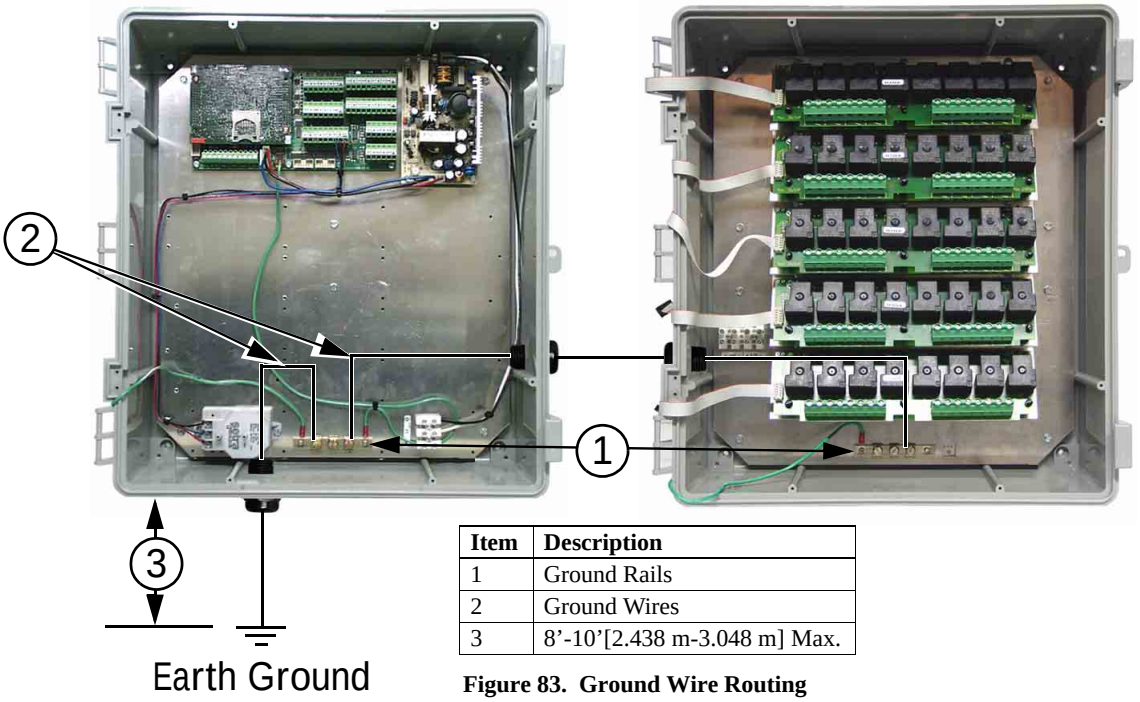
When wiring the Control it is recommended that the line voltage wires be brought into the bottom of the Boxes and the low voltage wires (Temperature Sensors, Potentiometers, relative humidity, etc.) be brought in the side of the Control Box **(See Figure 82)**.



Item	Description
1	Temperature Sensor, Potentiometer, relative humidity wires etc. (Low Voltage)
2	Line Voltage Wires
3	Input/Output wires (High Voltage)

Figure 82. Low Voltage Wire Routing

When grounding the Control, connect only the Ground Rail of the Main Box to the Earth ground. Connect the Ground Rail from the Main Box to the Ground Rail of the Relay Box. It is recommended that a ground rod be located no more than 8'[2.438 m] to 10' [3.048 m] away from the Control. The Chore-Tronics® 2 Control should be connected to ground using a 12 gauge wire or larger. As always, check the local electric code for additional requirements.



Item	Description
1	Ground Rails
2	Ground Wires
3	8'-10'[2.438 m-3.048 m] Max.

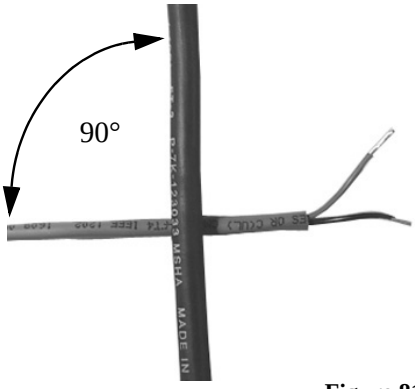
Figure 83. Ground Wire Routing

Analog Inputs

Analog Inputs consist of temperature sensors, the static pressure sensor, the relative humidity sensor and potentiometers (natural ventilation only). These inputs can be wired to any of the analog inputs (AI 1 thru AI 12) on the I/O board. The inputs that are pre-assigned are temperature sensors 1, 2 and 3, and the static pressure sensor. Use the diagram located on page 118 to record where each Input is wired to the Control.

Temperature Sensors

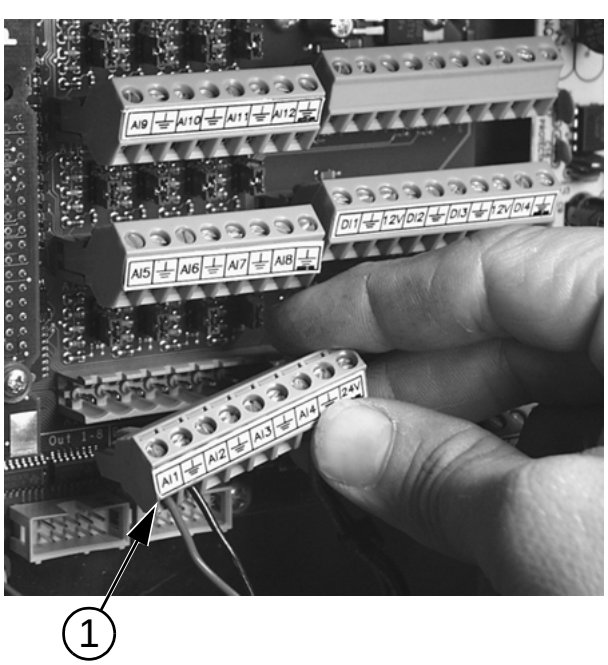
The Temperature Sensors require Non-Shielded 20 Gauge Twisted Pair Wire**.** This wire is available through Chore-Time. When routing this wire in the house be sure to keep it a minimum of 12"(305mm) away from line voltage wiring. If there is a need for the Sensor wire to cross line voltage wires cross them at a 90° angle to each other as shown below in **Figure 84.**

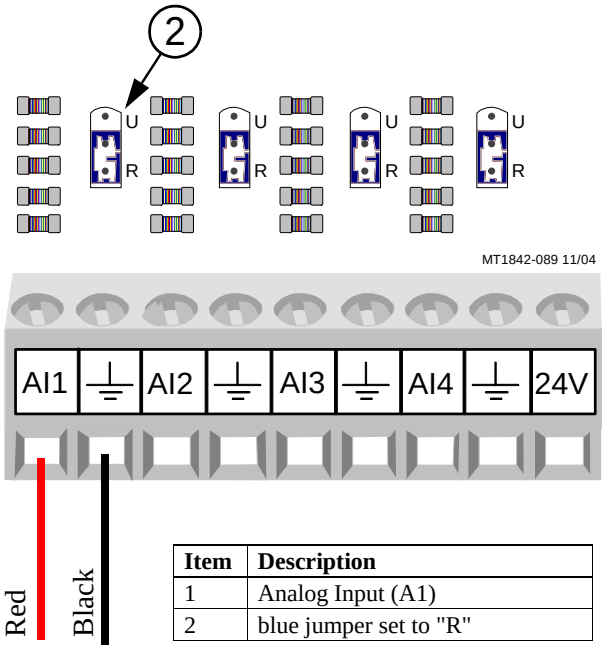


Item	Description
1	Non-Shielded Twisted Pair Wire
2	Line Voltage Wiring

Figure 81. 90° Cross-over

The Temperature Sensor wires can be connected to any one of the Analog Inputs (AI1 through AI12) of the I/O board. Whatever AI Inputs the Temperature Sensors are connected to, make sure that the blue jumper above each Input is set to "R" as shown in **Figure 85 below**. There are no polarity restrictions for the Temperature Sensors.



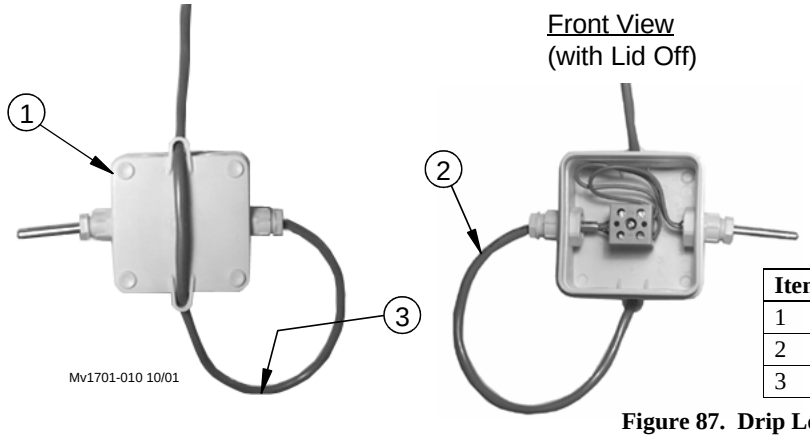


Item	Description
1	Analog Input (A1)
2	blue jumper set to "R"

Figure 86. Temperature Sensor Wiring

Temperature Sensors Continued.....

Route the wire through the back of the Temperature Sensor and connect it as shown in **Figure 87 below**. Pull the wire through the back of the box until a drip loop is formed as shown.



Item	Description
1	Temperature Sensor (Back Side)
2	Non-Shielded Twisted Pair
3	Drip Loop

Figure 87. Drip Loop

Static Pressure (SP) Wiring

There is a Static Pressure Sensor included with every Chore-Tronics® 2 Control. This sensor is pre-wired from the factory to Analog Input #4 (AI 4) **(Figure 88)**. If it is desired, the Static Pressure Sensor can be wired to any of the Analog Inputs (AI1 through AI12) **(See Figure 89 for example wired to AI2).** Please note that the Red wire must always be connected to the +24 volt terminal, the Blue wire must be connected to the AI terminal being used and the Black wire must be connected to the ground terminal of the analog Input being use. Make sure that whichever AI Input the SP sensor is connected to, that the blue jumper above the Input is set to "U" position **as shown**.

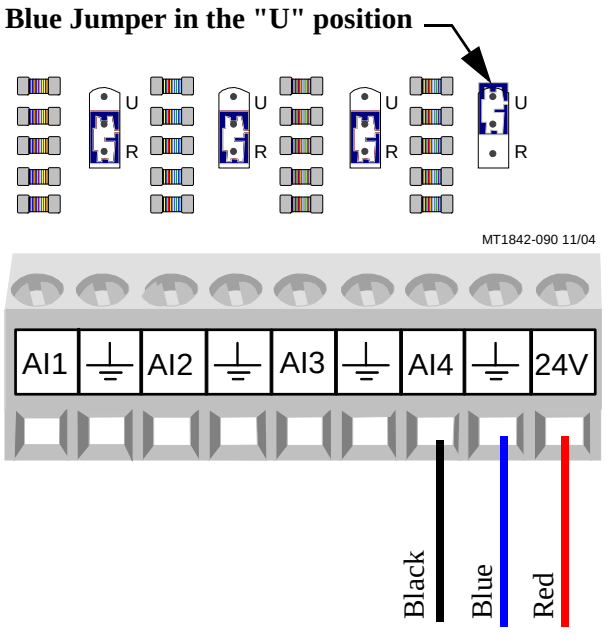


Figure 88. Static Pressure Sensor Pre-wired to AI4

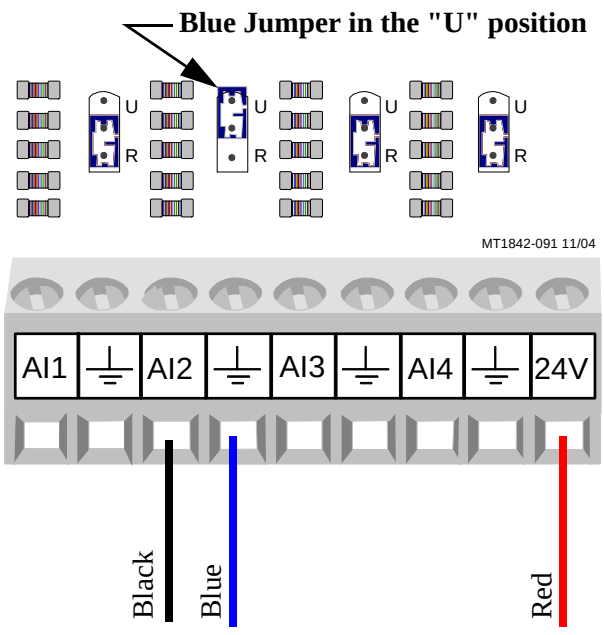
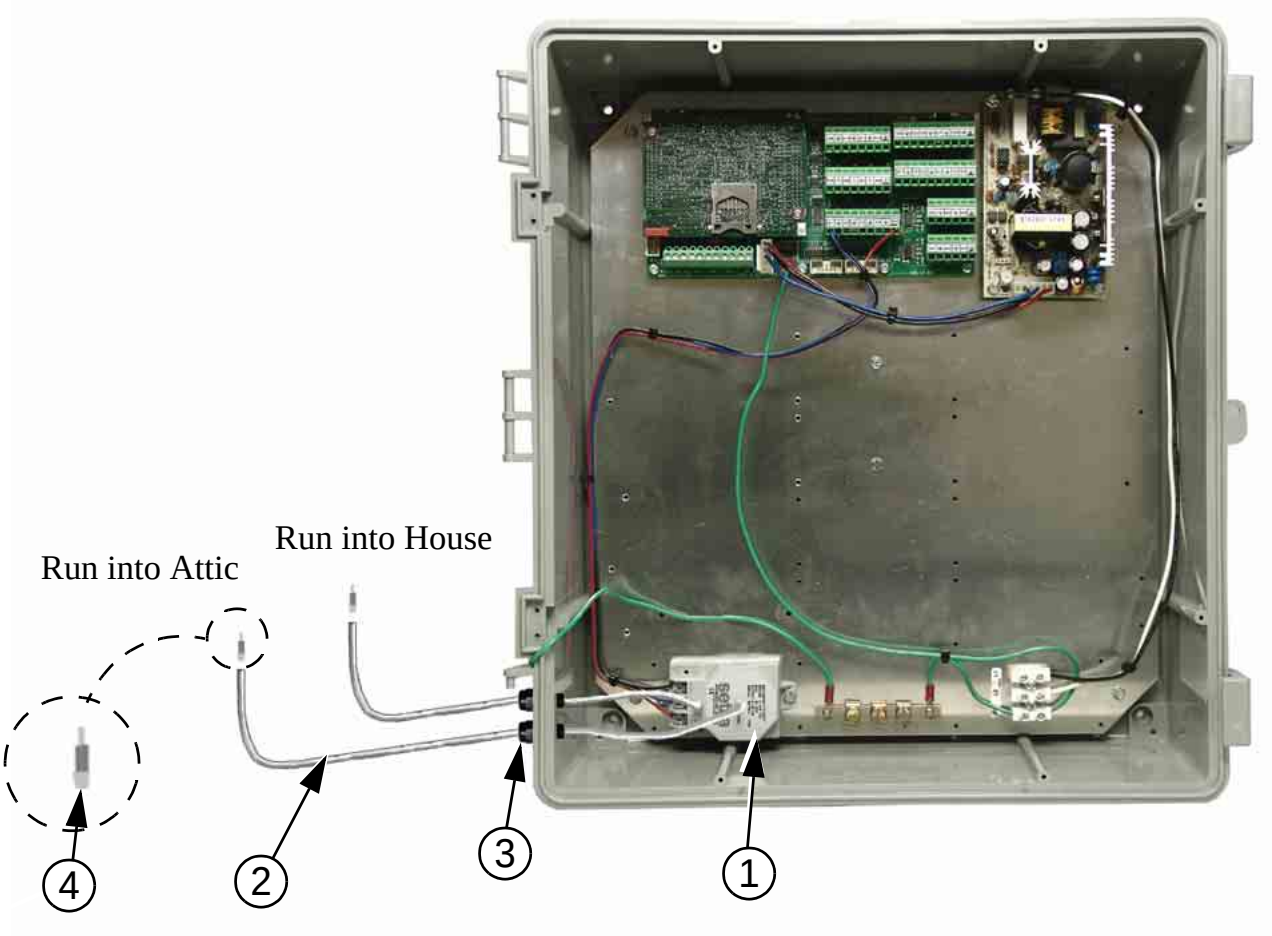
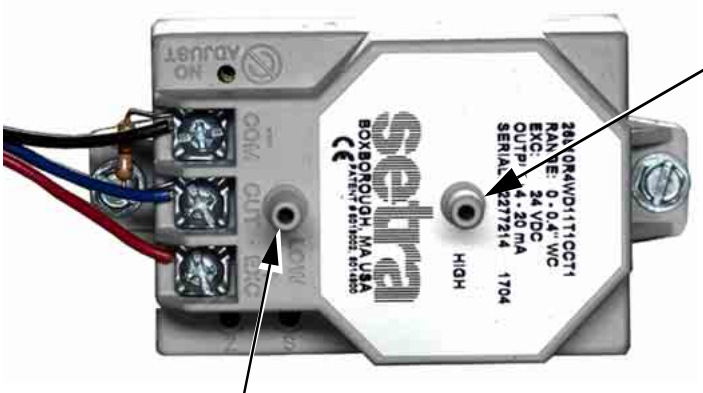


Figure 89. Static Pressure Sensor Wired to AI2

To route the Static Pressure Hoses into the Chore-Tronics® 2 Main Box, first drill two 5/8" holes in the side of the Chore-Tronics® 2 Main box next to the sensor. Place a ½" water tight connector **(Item 3, Figure 90)** into each hole and tighten using the hardware provided. Then route a 3/16" ID hose **(Chore-Time part number 43071)** through each of the water tight connectors. Connect one hose to the low pressure barb on the SP module. Then run that house into the house. Connect another hose to the high pressure barb on the sp module. Run that hose into the attic or to outside air. Make sure the high pressure hose is in still air. Once the hoses have been routed and connected, place the barb reducer plugs into the end of the hose opposite of the SP sensor.





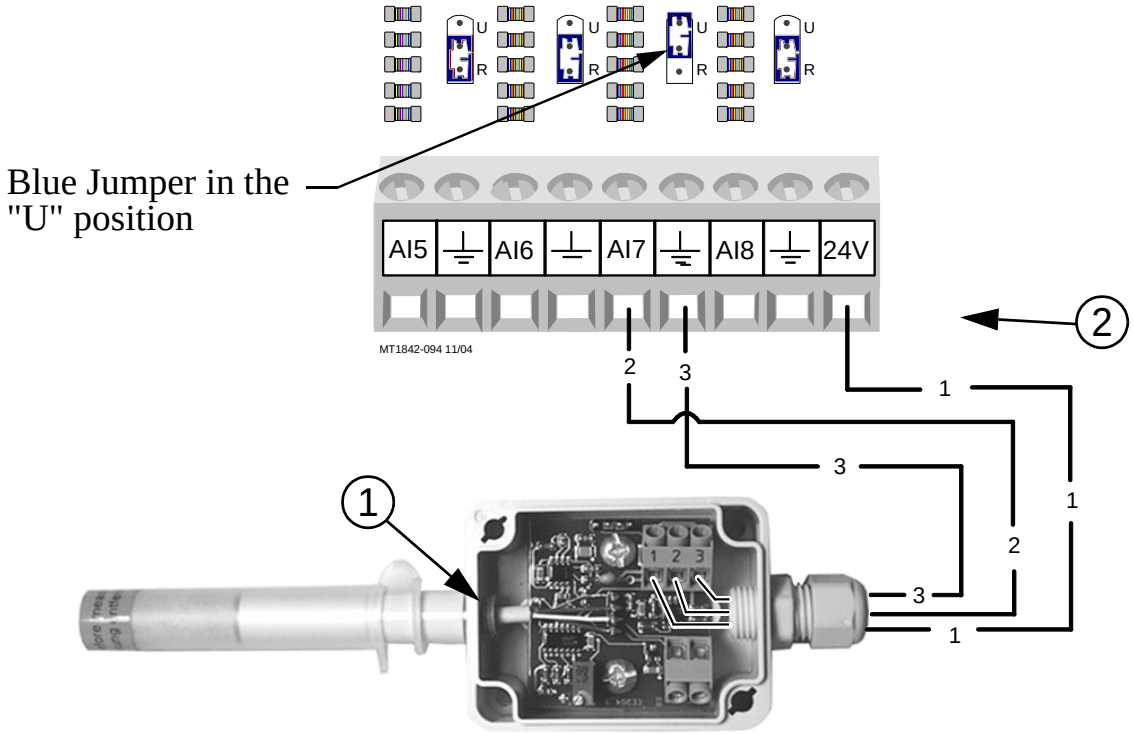
Item	Description
1	Static Pressure Sensor
2	Static Pressure Hose
3	1/2" Water Tight Connector
4	Barb Reducer Plugs

Figure 90. Static Pressure Sensor Hose Routing

Relative Humidity Sensor(RH) Wiring

The optional Relative Humidity Sensor **(Item 1, Figure 91)** requires a three-conductor wire to connect the sensor to the Chore-Tronics® 2 I/O board. The Sensor is connected to one of the Analog (AI) Inputs on the IO board.

Note: Terminal #1 on the relative humidity sensor is connected to the +24 v terminal on the IO board (see diagram). This is the same +24 v terminal used by the Static Pressure Sensor. Terminal #2 on the Relative Humidity Sensor is connected to the Analog Input (AI) terminal of the analog Input being used **(See Figure 87)**. Terminal #3 is connected to the ground terminal of the Analog Input (AI) being used. Make sure that the Blue Jumper above the Analog Input that the RH sensor is connected to is set to "U".



Item	Description
1	Relative Humidity Sensor
2	I/O Board Analog Input (AI) Terminal of your Choice

Figure 91. Relative Humidity Sensor Wiring

Alternative Relative Humidity Sensor(RH) Wiring

The Relative Humidity can also be wired to 12V. **(See Figure 92)**.

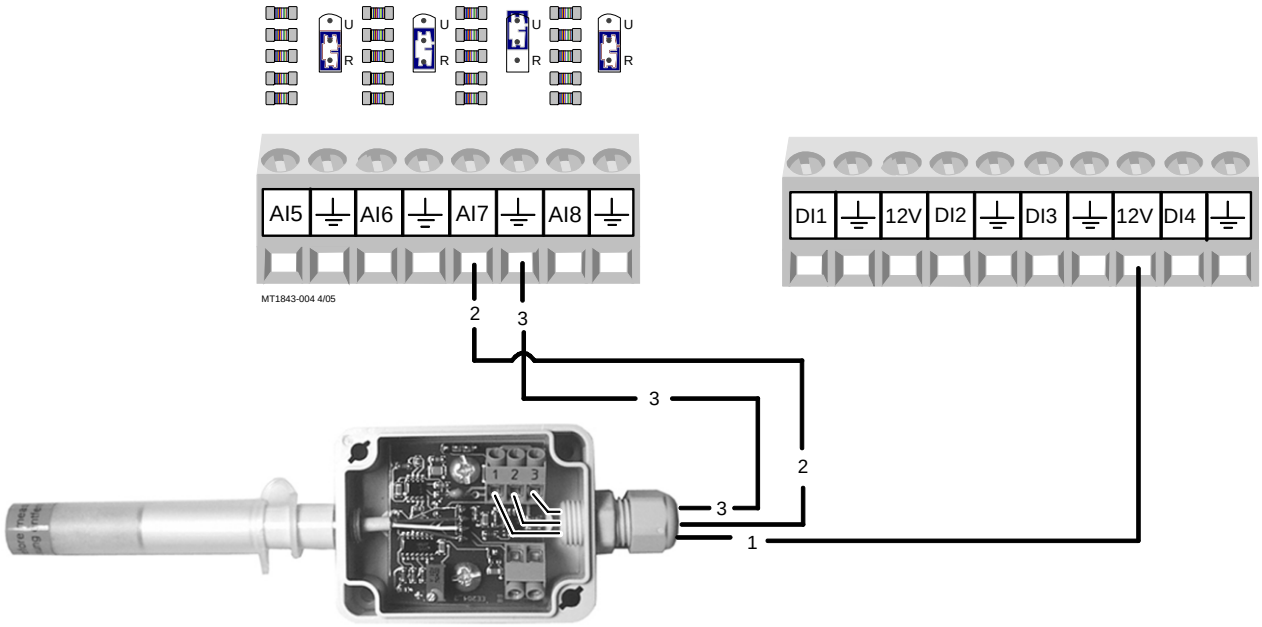


Figure 92. Relative Humidity Sensor Wiring

Potentiometer Wiring (Natural Ventilation only)

If natural ventilation is being used, the Potentiometer(s) that are attached to either the main curtain machine(s) (Internal Potentiometer), or the main curtain cables (External Potentiometer) need to be wired to the Chore-Tronics® 2 I/O Board. The Potentiometers need to be connected using the same Twisted Pair Wire that is used for the Temperature Sensors and follows the same wiring rules. Each Potentiometer needs to be wired to one of the Analog Input (AI) Terminals on the IO board. Make sure that whichever AI Input the Potentiometer is connected to that the Blue Jumper above the Input is set to "R" **(See Figure 93)**. To connect the sensor wire to the Potentiometer itself, please see Chore-Time instruction manual MV1251 for internal Potentiometer wiring, or MV1566 for external Potentiometer wiring.

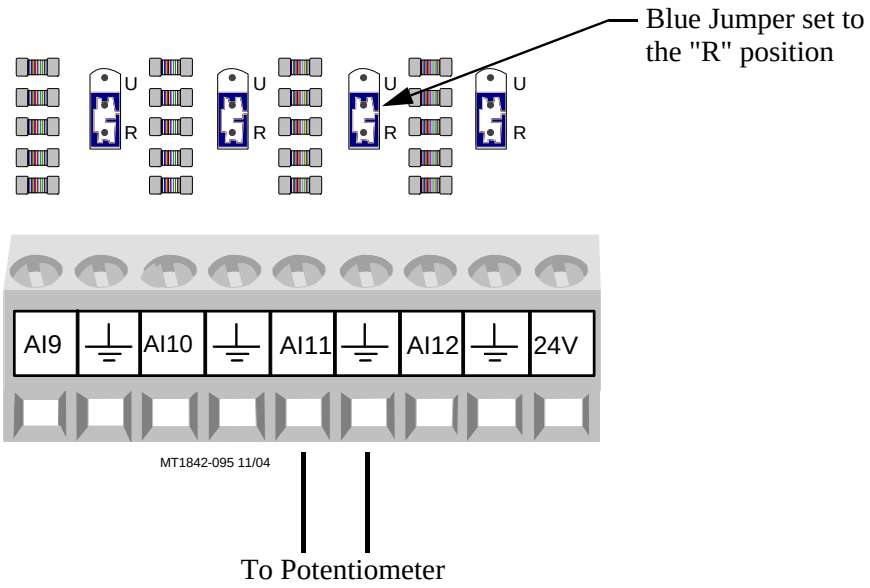
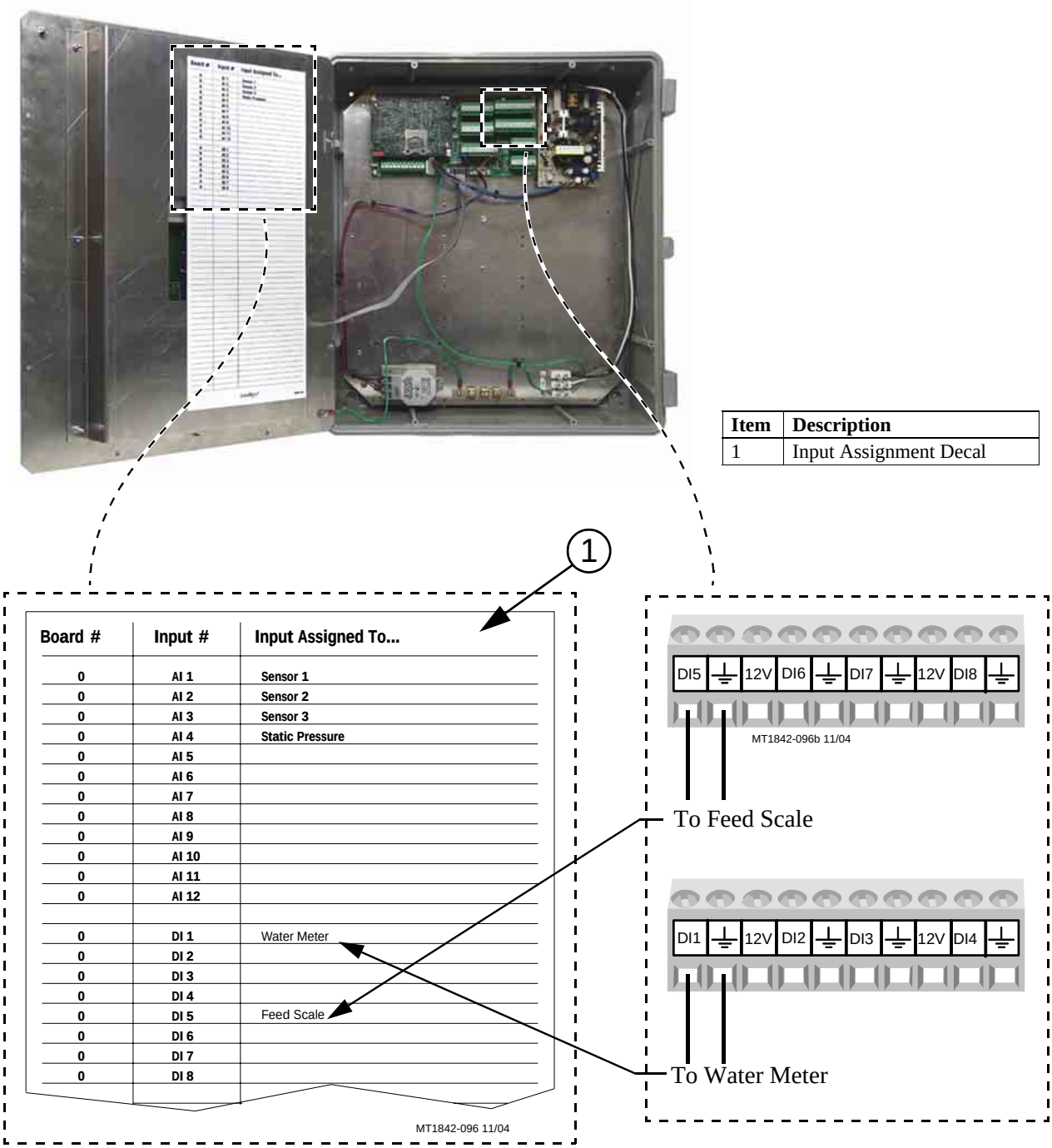


Figure 93. Potentiometer Wiring

Digital Inputs Wiring

Digital inputs consist of Water Meters, Feed Scales, Air Speed Sensor, Low Water Pressure Switch, Max Feed Run Time Alarm Input, and PDS Flush Feedback. These Inputs can be wired to any of the digital inputs (DI 1 thru DI 8) on the IO board **(Figure 94 below)**. Complete the analog input Assignment diagram on **page 118** to indicate where each digital input is connected to the IO board and also record it on the Input Assignment Decal **(Item 1, Figure 94)** that is placed on the Cover Plate inside the Chore-Tronics® 2 Main Box. Also refer to the following sections for information specific to each type of digital input.

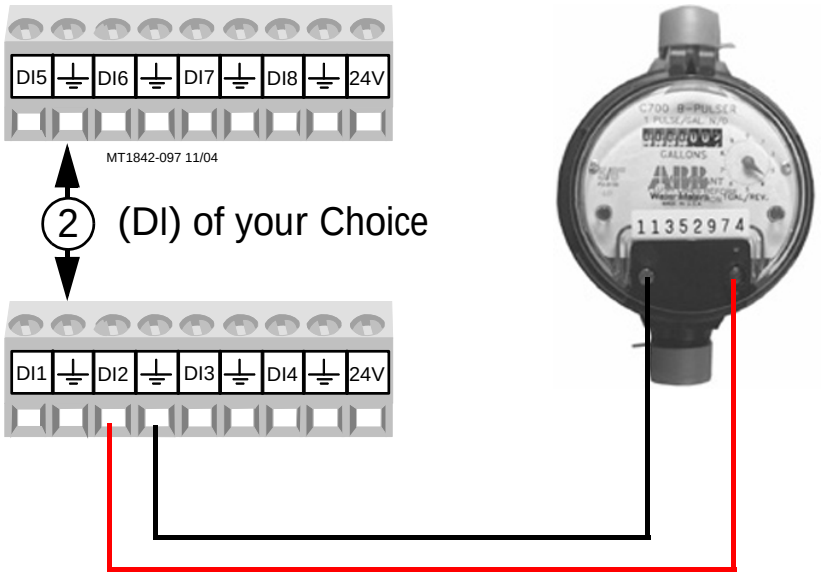


Item	Description
1	Input Assignment Decal

Figure 94. Digital Input Wiring

Water Meter Wiring

If there are Water Meters connected to the Control, they need to be connected to one of the Digital (DI) Inputs of the IO board. Use Twisted Pair Wire to connect the terminals on the Water Meter with the Chore-Tronics® 2 Control. If a Water Meter not sold by Chore-Time is used, make sure that it has a dry contact output. **Do not** use a Water Meter that sends voltage out with every pulse.

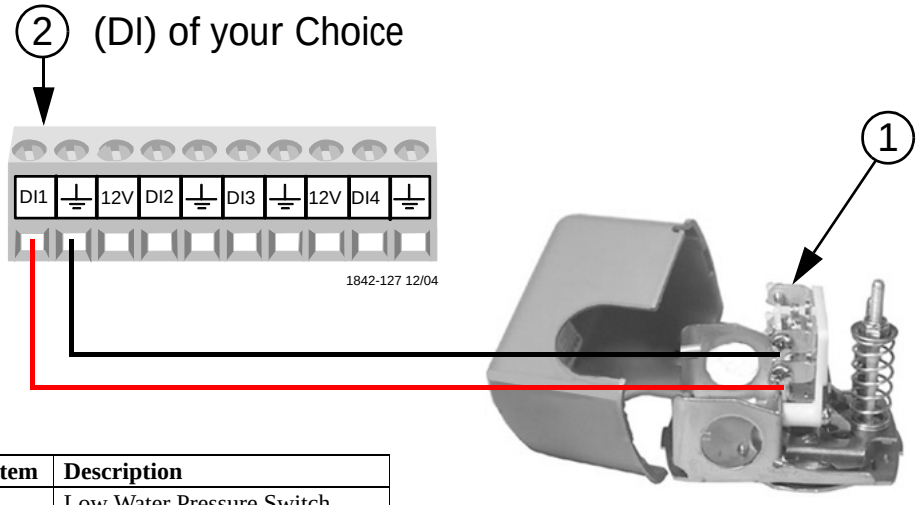


Item	Description
1	Water Meter
2	I/O Board Digital Input (DI) terminal of your Choice

Figure 95. Water Meter Wiring

Low Water Pressure Switch Wiring

If the Low Water Pressure Switch (Chore-Time part no. 46597) is used, it needs to be connected to one of the Digital (DI) Inputs of the IO board. Use Twisted Pair Wire to connect the Low Water Pressure Switch to the Control. If a non-Chore-Time pressure switch is used, make sure it is a low pressure, reverse action switch.

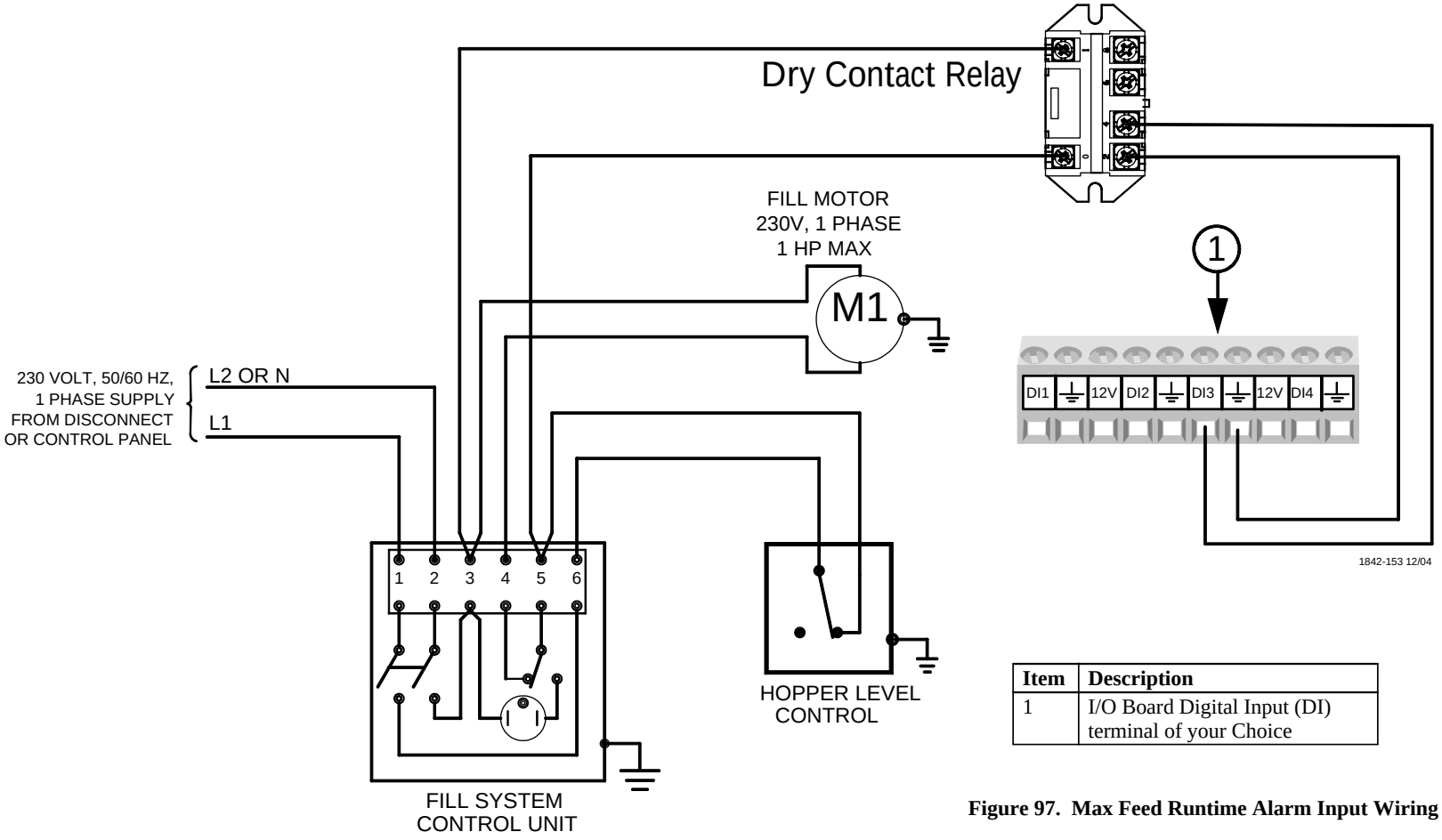


Item	Description
1	Low Water Pressure Switch
2	I/O Board Digital Input (DI) terminal of your Choice

Figure 96. Low Water Pressure Switch Wiring

Maximum Feed Runtime Alarm Input

If the Maximum Feed Runtime Alarm is used, the Input for the alarm must be connected to one of the Digital (DI) Inputs of the IO board. A dry contact relay must be connected to the IO board. The coil of the relay should energize whenever the fill system's hopper level switch closes **(See Figure 97)**.

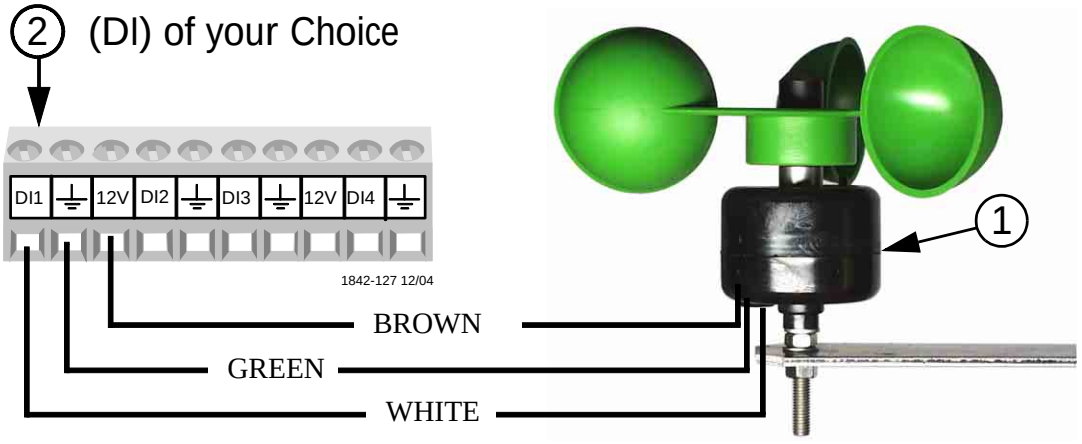


Item	Description
1	I/O Board Digital Input (DI) terminal of your Choice

Figure 97. Max Feed Runtime Alarm Input Wiring

Airspeed Sensor Wiring

The Airspeed Sensor requires a three conductor wire to connect the Sensor to one of the Digital (DI) Inputs on the IO board. It is recommended that the digital input chosen is adjacent to one of the 12 volt outputs on the IO board **(Figure 98)**. The Brown wire on the Sensor needs to be connected to the +12 volt output, the Green wire on the Sensor needs to be connected to the ground terminal of the digital input being used, and the White wire needs to be connected to the DI(x) terminal of the digital input being used.

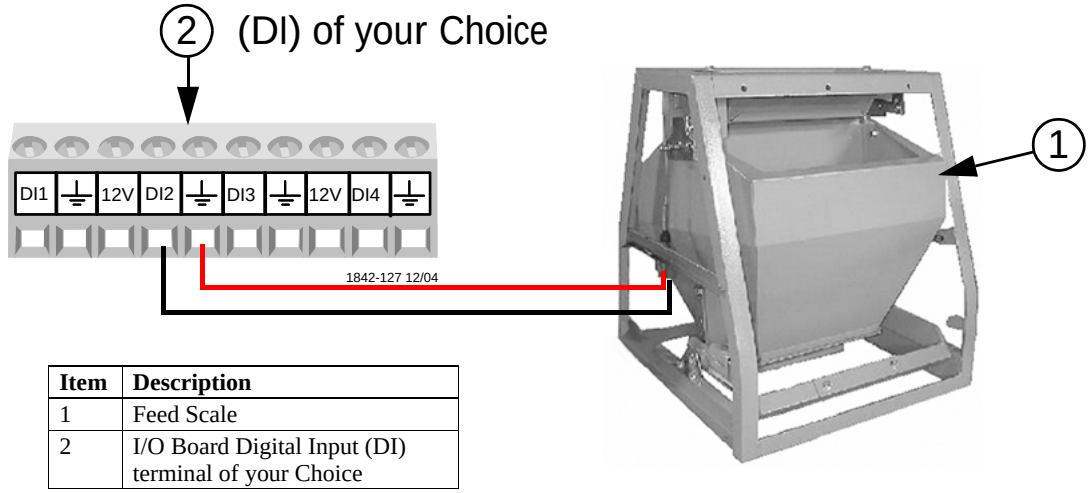


Item	Description
1	Airspeed Sensor
2	I/O Board Digital Input (DI) terminal of your Choice

Figure 98. Airspeed Sensor Wiring

Feed Scale Wiring

If one or more Feed Scales are used, they need to be connected to one of the Digital (DI) Inputs on the IO board using Twisted Pair Wire. Connect the switch located on the side of the Feed Scale to the IO Board using the blue and brown wires **(Figure 99)**. See manual MT1811 for more information.

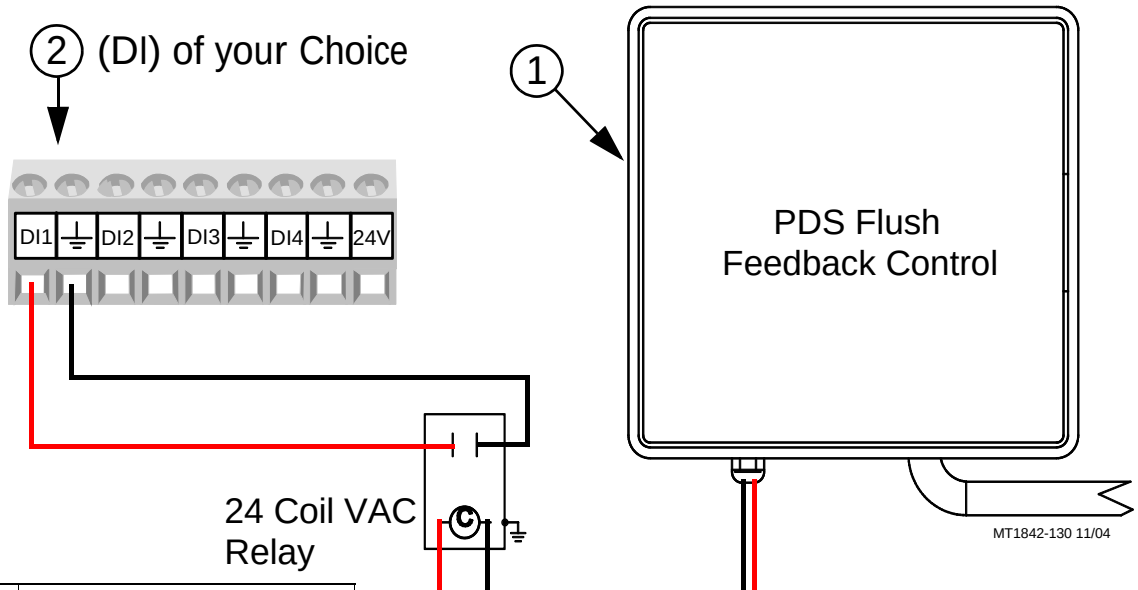


Item	Description
1	Feed Scale
2	I/O Board Digital Input (DI) terminal of your Choice

Figure 99. Feed Scale Wiring

PDS Flush Feedback Wiring

If a PDS Drinker Control is being used to automatically flush water lines, then the Control can ignore pulses coming from the Water Meter(s) while flushing is taking place. If this option is used then a dry contact relay must be connected to one of the Digital (DI) Inputs of the IO Board. The coil of the relay should be energized whenever the Control begins its flushing sequence. See **Figure 100 below** for connecting the relay to the IO board of the Control.



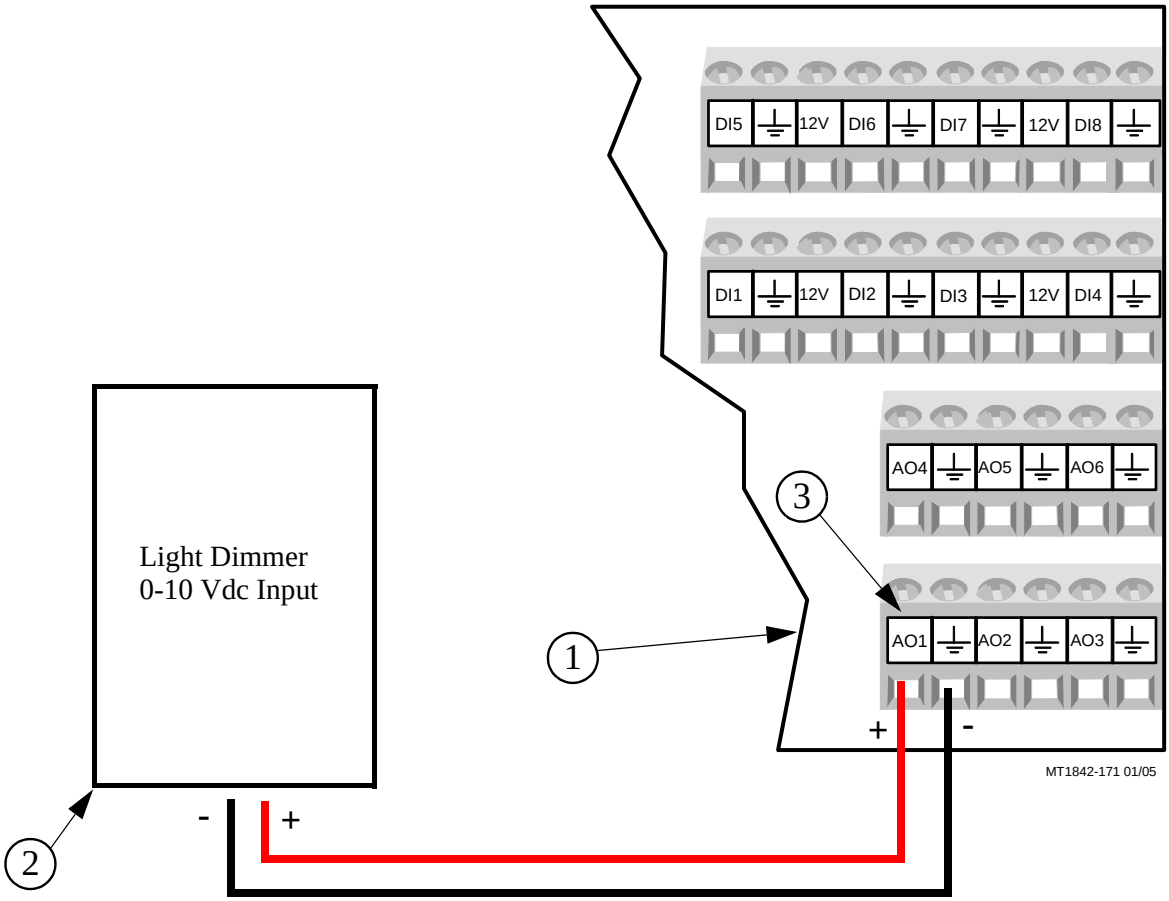
Item	Description
1	PDS Flush Feedback Control
2	I/O Board Digital Input (DI) terminal of your Choice

Figure 100. PDS Flush Feedback Wiring

Remote Light Dimmer Control Wiring

Before connecting the I/O board to a Light Dimmer, be sure to check that the light dimmer is equipped for remote control dimming. The Light Dimmer must be able to accept a 0-10 or 10-0 Vdc signal from the I/O board. Refer to the information provided by the Light Dimmer manufacturer for remote dimming wiring instructions.

The Light Dimmer connects to the I/O board at the analog output #1 (AO1) **(See Figure 101 below)**. Be sure that the positive terminal on the I/O board matches with the positive wire/terminal on the Light Dimmer.5



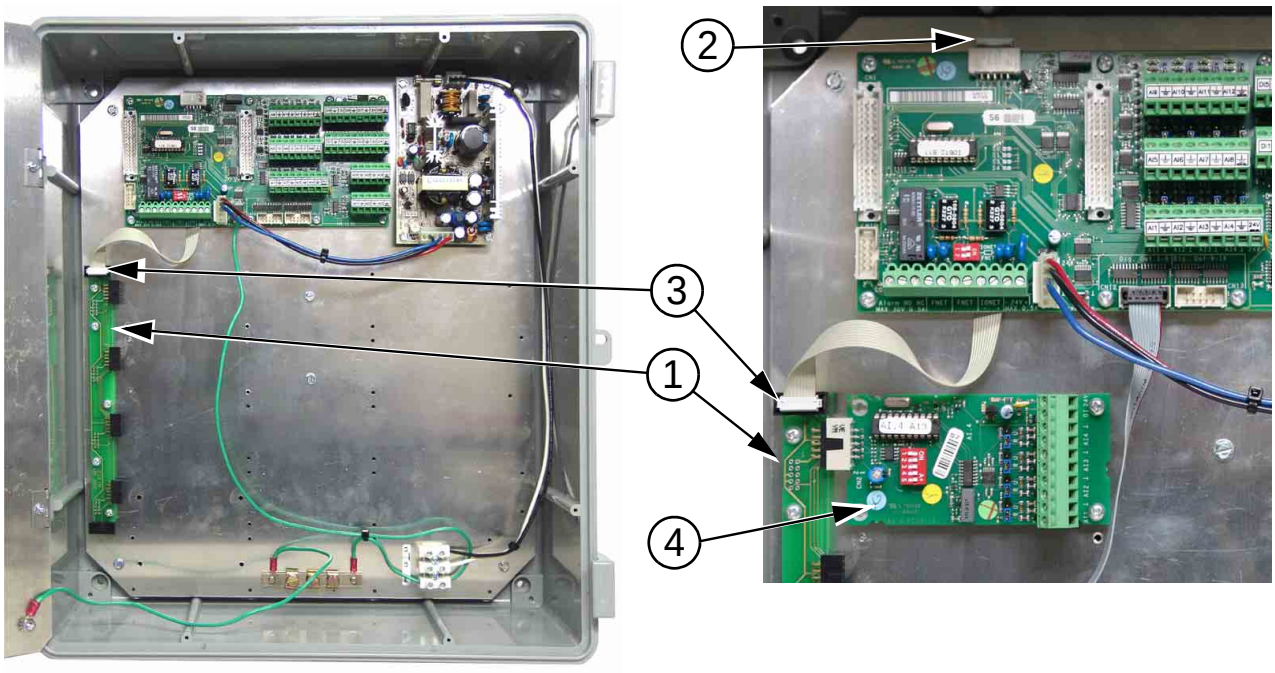
Item	Description
1	I/O Board
2	Light Dimmer
3	Analog Output #1

Figure 101. Remote Light Dimmer Control Wiring

Expansion Board Installation/Wiring

If it is desired to have more than 12 analog inputs and/or 8 digital inputs, then an Expansion Board(s) is needed to connect the inputs. There can be a maximum of 7 Expansion Boards added to the Chore-Tronics® 2 Main Box. These seven boards can consist of Analog Expansion Board, Digital Expansion Boards, or both.

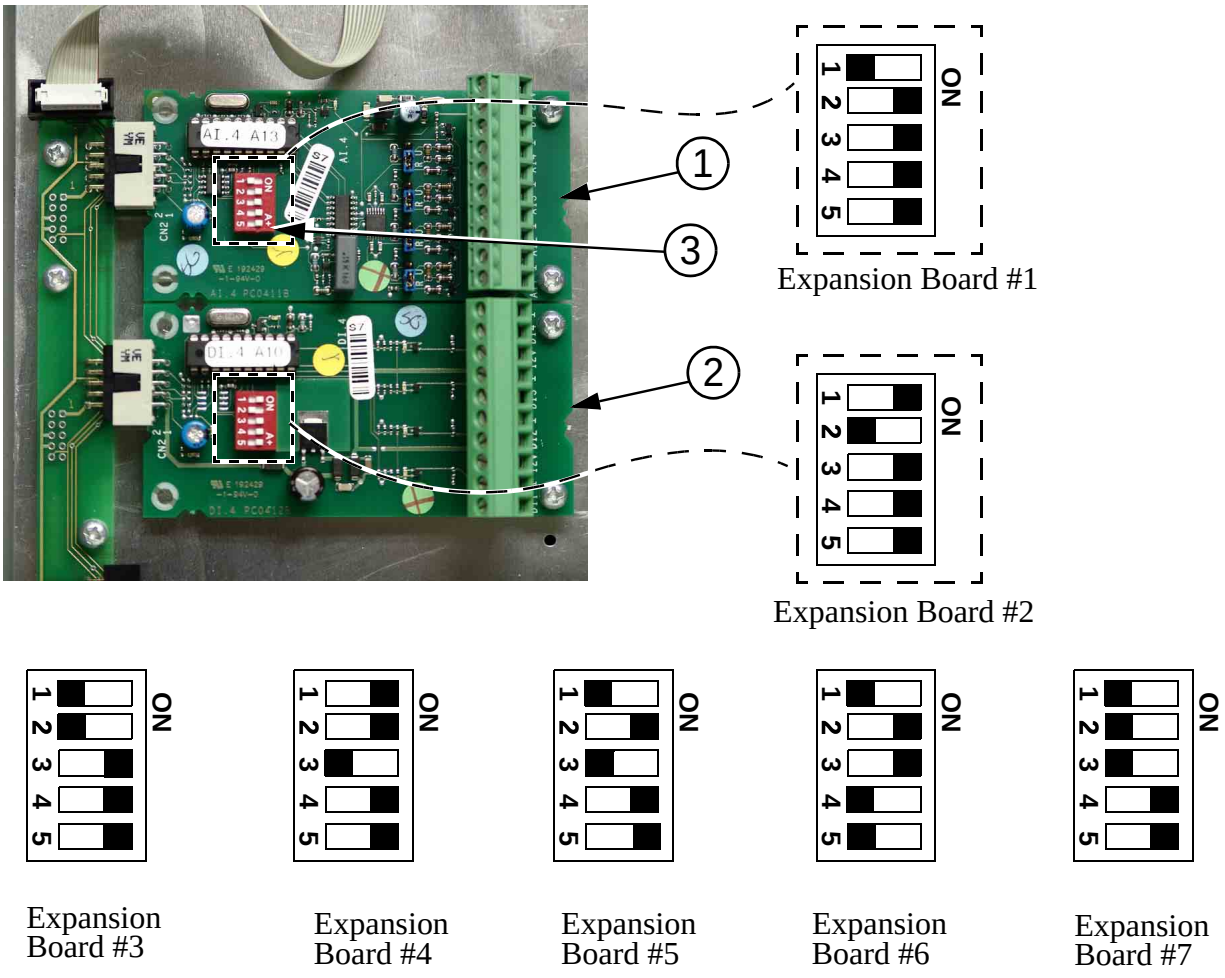
To add an Expansion Board, an Expansion Bus (I2C board) kit part no. 49667 must first be installed. Attach the Expansion Bus to the Back Plate using the hardware provided using existing holes as **shown in Figure 102 below**. Slide an Expansion Board into one of the Expansion Bus connectors. Attach the Expansion Board to the Back Plate using the hardware provided. Connect the Expansion Bus to the I/O Board with the Flat Cable provided as **shown**. **Note:** Remove the I/O Board and run the Flat Cable underneath it to keep it out of the way **as shown**.



Item	Description
1	Expansion Bus
2	Flat Cable End (I/O Board End)
3	Flat Cable End (Expansion Bus end)
4	Expansion Board

Figure 102. Expansion Boards

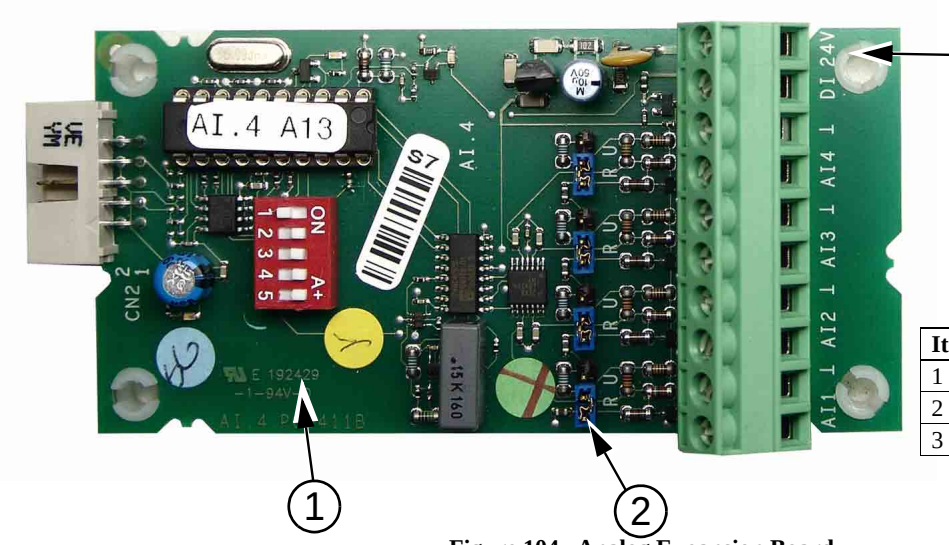
Expansion Board Dip Switch Setting- Each Expansion Board installed must have the DIP switches set properly. These DIP switches are used to assign a number to each Expansion Board so the Control can identify each Board. To assign the first Expansion Board installed to #1, set the DIP switches for Expansion Board 1 so that the number one switch is in the "OFF" position and the rest of the switches are in the "ON" position. **See Figure 103 below** for Dip Switch settings for all seven Expansion Boards. **Note:** Only the first two Expansion Boards are shown.



Item	Description
1	Expansion Board #1
2	Expansion Board #2
3	Expansion Board Dip Switch

Figure 103. Expansion Board Dip Switch Settings

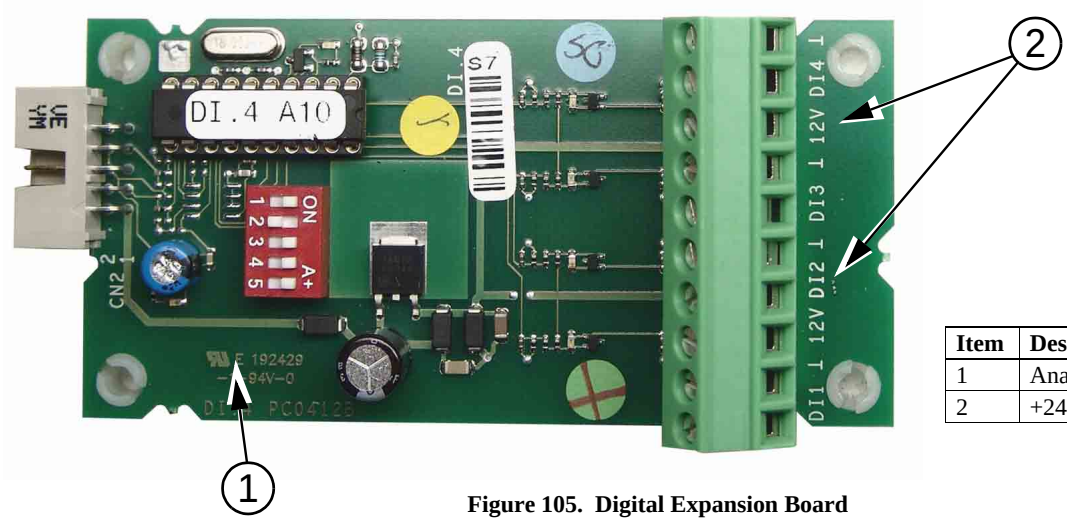
Analog Expansion Boards- Each Analog Expansion Board (AI.4 board) adds 4 additional Analog Inputs to the Chore-Tronics® 2 Control. There is a Blue Jumper located above each Analog Input **(Item 2, Figure 104)**. This Blue Jumper needs to be set in the "R" position if a resistive Analog Input (Temperature Sensors and Potentiometers) is connected. The Blue Jumper should be set to "U" if a voltage Analog Input (Static Pressure Sensor, Relative Humidity Sensor) is connected. There is a +24 Vdc output available if needed. When assigning the Input in the Setup-General screen make sure that the number of the Analog Expansion Board is correct along with the number of the Analog Input itself (1-4). It is highly recommended that the name of the Input as well as its assigned location be written on the Input Decal located on the Cover Plate of the Main Box and also recorded in the **Input Assignments Diagram on page 118**.



Item	Description
1	Analog Expansion Board
2	Blue Jumper
3	+24 Vdc Output

Figure 104. Analog Expansion Board

Digital Expansion Boards- Each Digital Expansion Board (DI.4 board) adds 4 additional digital inputs to the Chore-Tronics® 2 Control. There are multiple +12 Vdc outputs available if needed **(Item 2, Figure 105)**. When assigning the Input in the Setup-General screen make sure that the number of the Digital Expansion Board is correct along with the number of the digital input itself. It is highly recommended that the name of the Input as well as its assigned location be written on the Input decal located on the cover plate of the main box and also recorded in the **Input Assignment Diagram on page 118**.



Item	Description
1	Analog Expansion Board
2	+24 Vdc Output

Figure 105. Digital Expansion Board

Starting the Control

Once the Control, Back Up Box, and all outputs have been installed and wired properly, power should be turned on to the Control. When power is first turned on to the Control the screen should look like **Figure 106**.

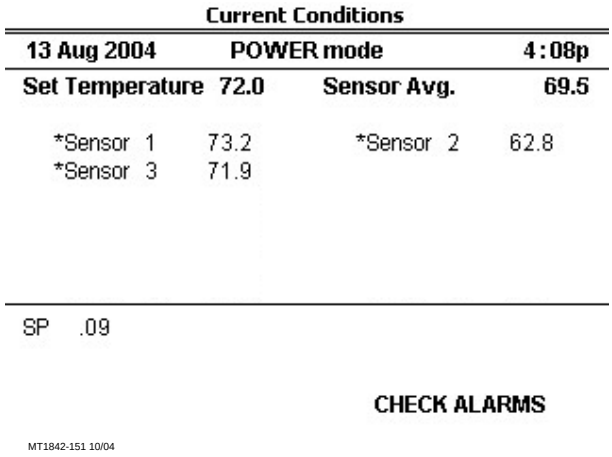


Figure 106. Power on Screen

The light next to the Alarms Button (Button 8) should be flashing green. If the screen is hard to read, the intensity may need to be adjusted. To adjust the Intensity of the screen, hold the 3 key on the Numerical Keypad down, and use the Up and Down Buttons as shown in **Figure 107 below**. If the Control is mounted in a non-insulated area the screen may need to be adjusted periodically because temperature can effect the readability of the screen.

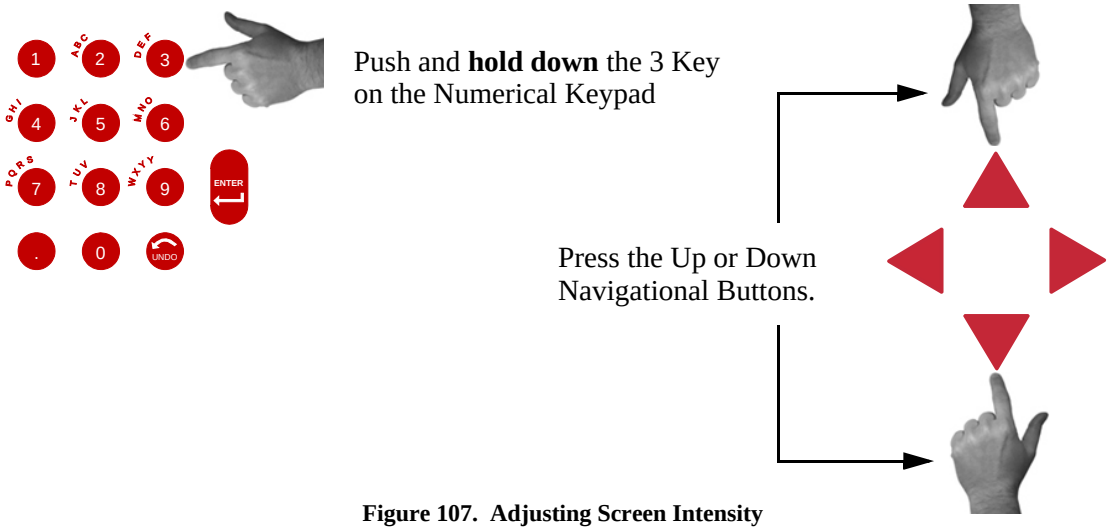
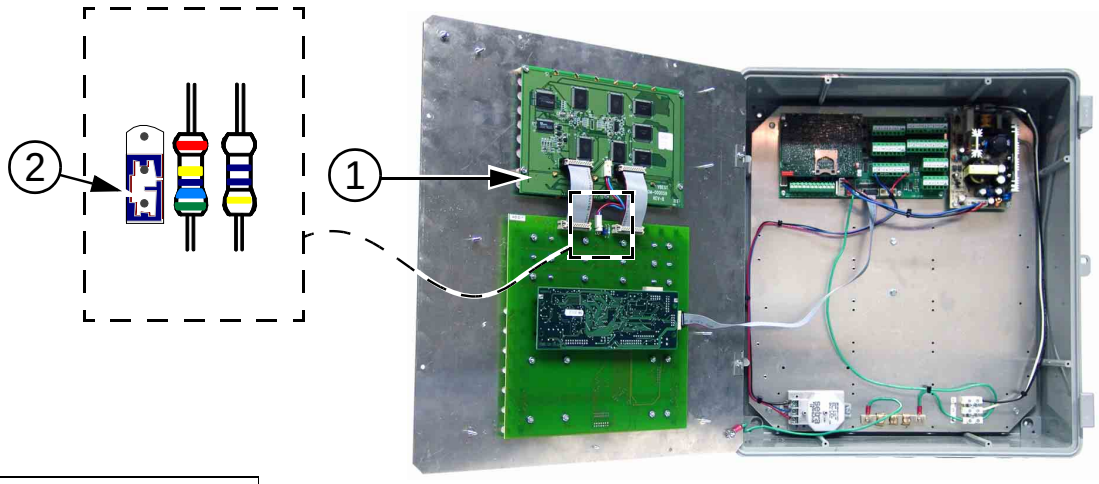


Figure 107. Adjusting Screen Intensity

Backlight Jumper

If no backlight appears when the Control is turned on, check the position of the jumper **(Item 2, Figure 108)** in the upper middle section of the KB Board. The jumper should be in the "down" position..

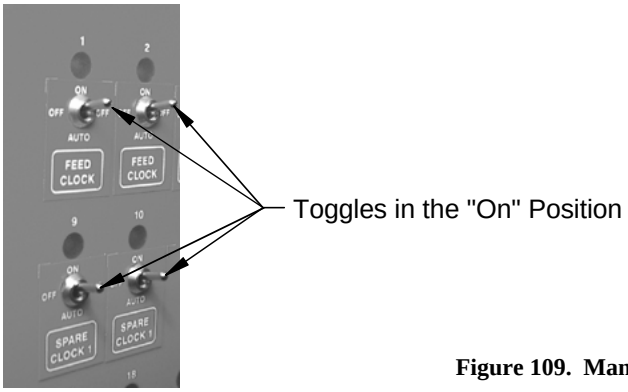


Item	Description
1	KB Board
2	Jumper "Down Position"

Figure 108. Backlight Jumper

Once the screen has been adjusted, all assigned outputs should be tested individually by placing the Manual Switches located on the Relay Box to the "**MANUAL ON**" position **(See Figure 109)**. This will also serve as a way of verifying that the proper output was wired to the proper Relay and/or the proper Output Sticker was placed over the Toggle Switch.

Caution: Before turning any Switch to the on position, make sure all people and objects are clear of the device being turned on to avoid injury or damage.



Mt1701-061 1/01

Figure 109. Manual "On"

Note **When testing the Toggle Switches for the Curtain and Inlet Machines, be sure to test them one Switch at a time.**
After testing the open switch, place it in the manual "off" position before placing the close switch in the manual "on" position. If you try to put both switches in the manual "on" at the same time you will send a double signal to the Curtain Machine Motor.

Testing the Back Up Box

To test the Back Up Box, first turn the power off to the Chore-Tronics® 2 Control only. This should cause the Tunnel Curtain to open and the first set of Back Up Fans should activate. If this test is successful, turn the power back on to the Chore-Tronics® 2 Control. Then adjust thermostat number one until it activates. Then adjust the second thermostat until it activates. This should cause the second set of Back Up Fans to activate. After all Back Up Fans are operating, deactivate the first two thermostats. Than adjust the third thermostat until it activates. This should cause the Back Up Heaters to activate.

After all of the outputs and back ups have been successfully tested, make sure all manual toggle switches are in the manual "off" position and proceed to the **"Initial Set Up"** portion of this manual beginning on **Page 48**.

Wiring of Outputs

The outputs for the Chore-Tronics Controls (Fans, Curtain Machines, Brooders, etc.) are wired to one of the Relays on the Relay Module or (RM Board(s). The RM Board consists of eight 1hp motor load Relays. Each Relay has single-pole, single-throw normally open contacts. It is strongly recommended that the assignment of outputs to the Relays be done before starting to wire the Control. This will make routing of the electrical wires through the Relay box much easier **(See Figure 110)**.

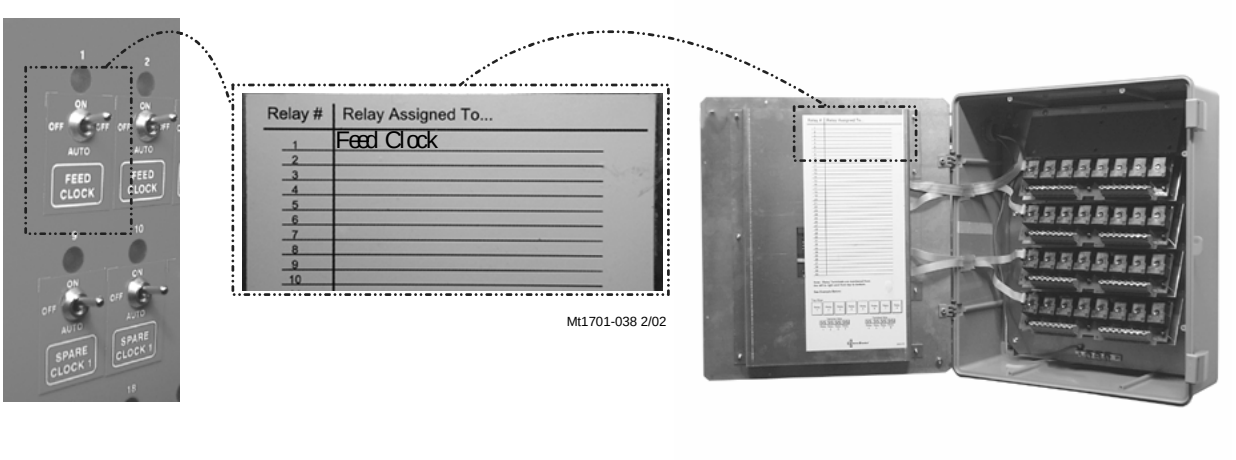
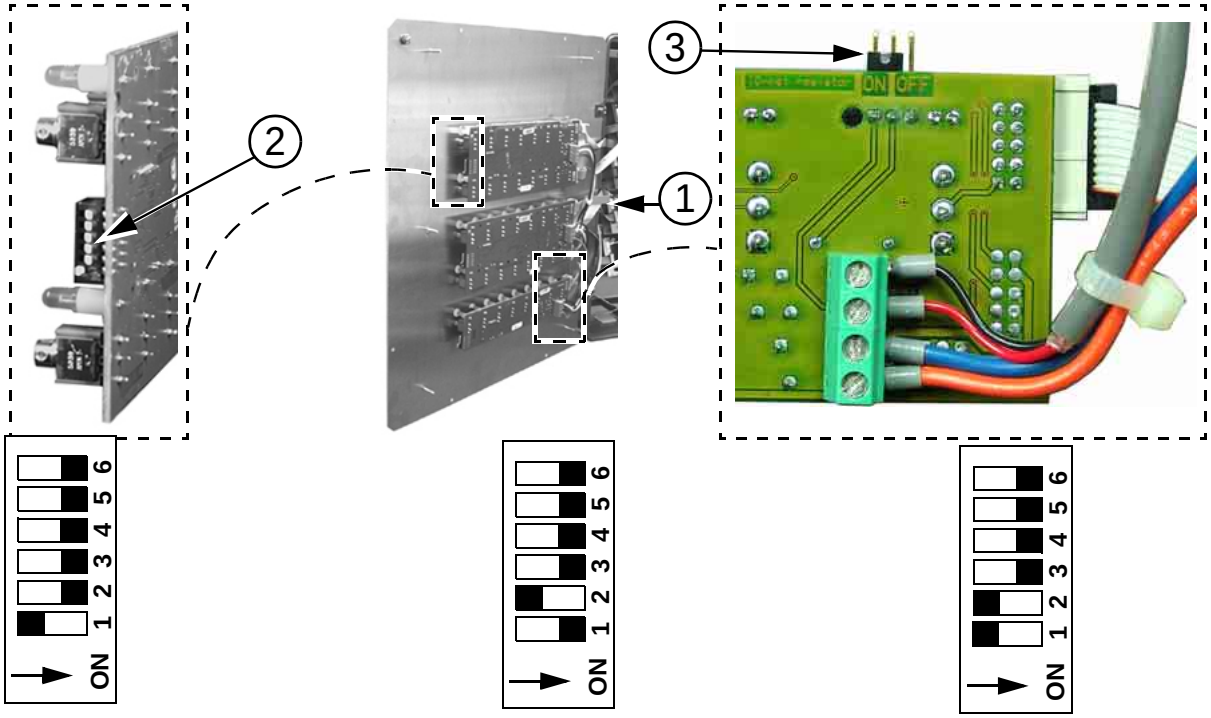


Figure 110. Relay Assignments

The appropriate output stickers should be placed over the toggle switches used, if it has not already been done prior to mounting. Please see the wiring diagrams on the following pages for wiring Chore-Time ventilation equipment. (Wiring diagrams for Fans, Linear Lifts, Super Lifts, Brooders, Turbo Cool, Mister Cool). For other types of equipment please refer to wiring diagrams supplied with the equipment.

MS Board Dip Switch Positions

The MS Board Dip Switches are located on the ends of the Manual Switch Boards as shown in **Figure 111 below.** New Controls come from the factory preset. This information is provided only when a replacement board is used. **See Figures 111 and 112 below** for Dip Switch settings for the First and a Second Relay Box if used. **Note:** If the bottom most Board is replaced, make sure the Jumper in the upper right hand corner of the board is in the "On" position.



Dip Switch Position on **1st Board**-With one Board being used.

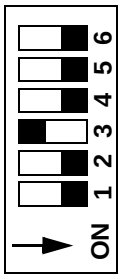
Dip Switch Position on **2nd Board**-With two Boards being used.

Dip Switch Position on **3rd Board**-With three Boards being used.

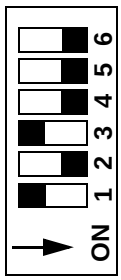
Item	Description
1	Relay Box
2	Dip Switch
3	Jumper "ON" position

Figure 111. Dip Switch Settings 1st Relay Box

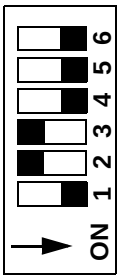
Dip Switch Settings for the Second Relay Box



Dip Switch Position on **4th Board**-With four Boards being used.



Dip Switch Position on **5th Board**-With five Boards being used.

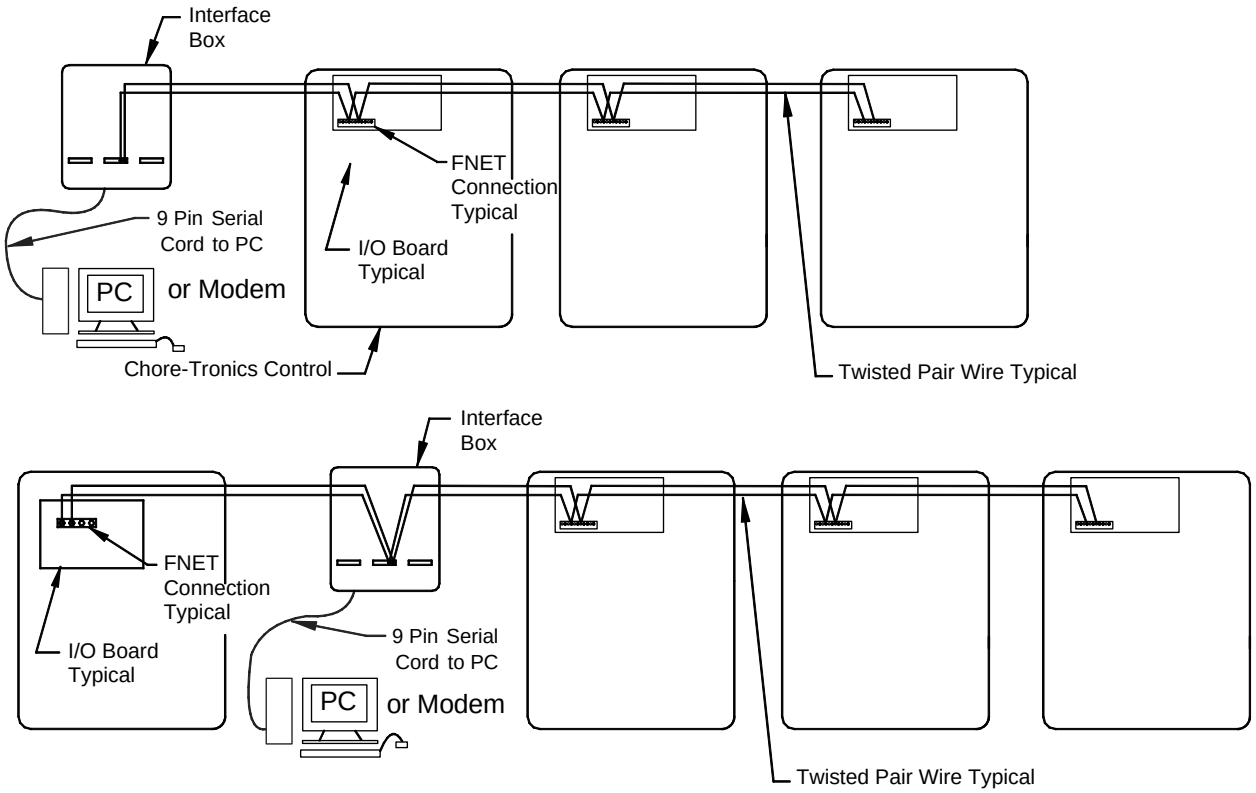


Dip Switch Position on **6th Board**-With six Boards being used.

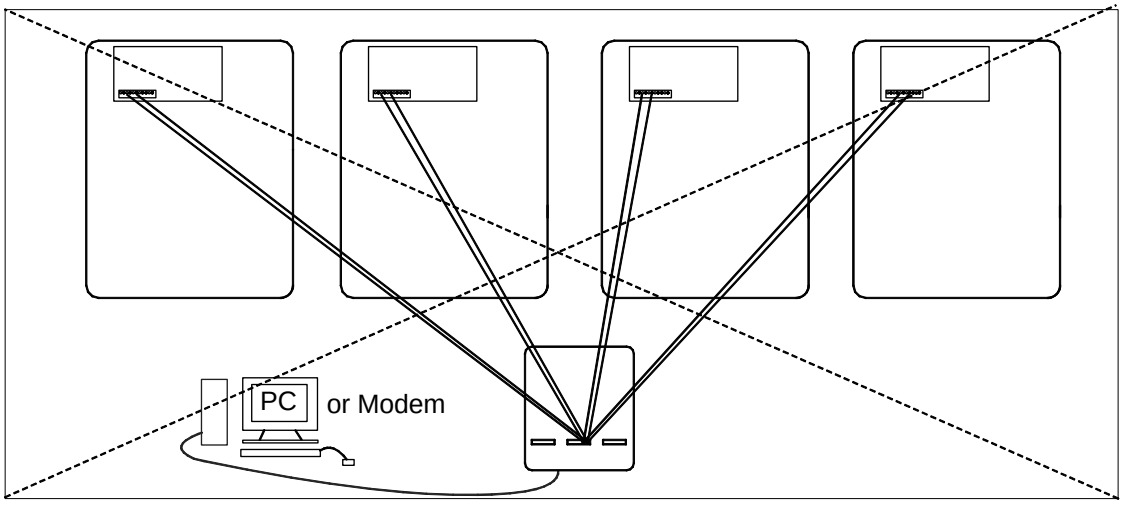
Figure 112. Dip Switch Settings 2nd Relay Box

PC Connection

The Controls in each house are connected together at the FNET Terminal Connectors as shown below. To see where the FNET Terminal Connectors are located on the I/O Board **see Wiring secion of this manual**. Use only Twisted Pair Wire (Chore-Time Part No. 42208). The Interface Box can be wired in anywhere either at the beginning of your string, at the end, or between Controls; but not to more than one Control as shown in **Figure 113 below**.



Incorrect Installation



1842-136 12/04

Figure 114. PC Connection

Troubleshooting

Programming Trouble Shooting

Problem	Possible Cause	Possible Solution
Can not lower set temperature below 32.0° F. and can not raise the set temperature above 120.0° F.	Normal set temperature range.	The Control has been set up so that set temperature range is between 40.0° F. and 120.0° F.
Have one Fan set to come on at 80°F and another Fan to come on at 80.3°F, but the Control won't accept the 80.3° setting.	Offsets too close.	There must be at a .5°F difference between any two Fan outputs. Two or more Fans may be set to come on at the same temperature. Heater outputs follow the same rules, however the cool out puts do not.
Fan(s) turns on, Mode Sensor(s) temperature is at set point.	A.) Fan is assigned to a Timer. B.) Temperature Sensor(s) assigned to operate the Fan are different than the mode Sensor(s). C.) Fan's manual switch is set to the manual "on" position. D.) Bad Relay Module/MS Board.	A.) If Timer is not wanted on Fan remove the Timer in the "Outputs and Temperatures" screen. B.) Change Temperature Sensor(s) assignments in the Setup-General: Outputs Screen if desired. C.) Put manual switch in "automatic" position. D.) Replace Module/Board
Fan(s) will not turn on when mode Sensor(s) reach the Fan's on temperature.	A.) Fan's assigned Sensor(s) are different than the mode Sensor(s) B.) Fan is set to run in a different mode (example: Tunnel instead of Power). C.) Fan's manual switch is set to the "off" position. D.) Bad Relay Module/MS Board.	A.) Change Temperature Sensor(s) assignments if desired. B.) Go to the "Setup" screen and change modes of operation if desired. C.) Put manual switch in "automatic" position. D.) Replace Module/Board
Fan(s) will not shut off.	A) Fan has not reached the "off" temperature. B.)Fan assigned Temperature Sensor(s) is different than mode Temperature Sensor(s). C.) Fan's manual switch is set to the manual "on" position. D.) Bad Relay Module. E.) Back-up thermostat is overriding the Control.	A.) The Fan's "off" temperature is the "on" temperature of the next Fan below it, or if desired you can program the "off" temperature. B.) Change Temperature Sensor(s) assignments in the Setup-General: Outputs screen if desired. C.) Put manual switch in "automatic" position. D.) Replace Module/Board. E.)Check setting of back-up thermostat and correct if necessary.

Programming Troubleshooting Continued.....

Problem	Possible Cause	Possible Solution
Fan assigned to operate in Power Mode only is running in Natural Mode.	A.) A “Pot Not Responding” or a “Pot Outside Limits” alarm has occurred. B.) Fan Switch in "Manual ON" position	A.) Find out cause of alarm and correct. Please see Potentiometer troubleshooting section for suggestions. B.) Move Switch to automatic
Fan anticipation feature is not working.	A.) Minimum Ventilation Fans assigned to something other than Minimum Ventilation Timer, or no Timer at all. B.) Other Fans (example: Stir Fans) are already operating due to temperature settings.	A.) All Fans intended for minimum ventilation must be assigned to the Minimum Ventilation Timer. B.) If any other Fans are operating at the time the Minimum Ventilation Timer reaches its On Time, the anticipation function is disabled.
Tunnel Curtain does not completely open when going into Tunnel Mode.	A.) If in the "Static Pressure" screen the high Control limit is set to something other than .00 under Tunnel Mode, than the Control will adjust the Tunnel Curtain for static pressure. B.) Limit Switches on Curtain machine are not set properly C.) Problem with Curtain and/or cabling.	A.) To stop Static Pressure Control on the tunnel, set the high static pressure limit to .00 under Tunnel Mode in the (Main Menu) "Static Pressure" screen. B.) Check limit switches and adjust as necessary. C.) Correct cabling and/or Curtain problem.
Tunnel Curtain opens completely before adjusting to static pressure.	A.) Tunnel Curtain speed and/or full movement distance improperly entered in the "Setup" screen B.) .00" static pressure setting in the (Main Menu) "Static Pressure screen".	A.) Correct Tunnel Curtain speed and/or full movement numbers. B.) Set desired static pressure settings for Tunnel Mode

Programming Trouble Shooting Continued.....

Problem	Possible Cause	Possible Solution
Tunnel Curtain opens in Power Mode.	A.) Power-Tunnel Mode Transition.	A.) Normal Operation
	B.) High static pressure alarm safety feature has taken over.	B.) Static pressure had quickly built to above 0.20" and stayed there for over the wind delay setting. Tunnel Curtain will open to maintain a static pressure of between 0.18 and 0.20." This is usually accompanied by a high static pressure alarm. Find cause of high static pressure and correct.
	C.) Additional inlet area through the Tunnel Curtain feature has taken over.	C.) Normal operation. Whenever the air Inlets do not provide enough air, the Tunnel Curtain will also open enough to maintain static pressure within the Power Mode limits.
When half-house brooding the Minimum Rel. alarm is continually going off. The Sensor(s) indicated are always in the non-brood end.	One or more non-brood end Sensors are assigned as Mode Sensors and/or there are non-brood sensors assigned to the power mode sensors in the Alarms Screen.	Remove non-brood Sensor(s) as Mode Sensors when brooding. Sensor(s) can still be assigned to heaters, etc. to keep non-brood end temperature above freezing.
It is a cool-breezy day, and when the Control goes into Natural Mode the Curtains open to the first opening position (example: 12 inches on a 48-inch Curtain). After about 30 seconds the Control goes back into Power Mode and the Curtains close right back up. It does this several times.	Normal Operation	If the temperature drops .6× F in the first two minutes, the Curtains are given a continuous close signal and the Control goes back into Power Mode. This is the quick temperature check as described in the Mode Transitions, "**Power to Natural**", section of this Manual.

Equipment and Potentiometer Troubleshooting

Problem	Possible Cause	Possible Solution
Display difficult to read.	A.) Display intensity needs adjusted. B.) Back light on display board unplugged or defective.	A.) See **page 89** for procedure on adjusting screen intensity. B). Check two wire plug on Display board. Replace if defective.
Display Completely Blank.	A.) Flat cable(s) between KB board and Display board is unplugged or defective. B.) Defective Display board. C.) Defective HI board. D.) Defective KB Board	A). Check flat cable connections. Replace cable if defective. B). Replace Display Board. C). Replace KD Board. D.)Replace KB Board
The Control says that the pressure in the house is .00" and will not move.	There is a wire connection problem between the static pressure monitor and the IO board. When the static pressure monitor is disconnected from the IO Board the Control defaults to a reading of .00"	Check for wires being switched, broken wires, wires not making a good connection, etc. An easy way to remember the wiring is that the red wire is connected to the positive terminal of both the IO board and the static pressure monitor.
Temperature Sensor reading very low, but is not stuck on 0° F.	A.) Connections in Temperature Sensor junction box, and/or I/O Board have become loose and/or corroded. B.) Defective Temperature Sensor.	A.)Check all Temperature Sensor connections, correct any problems. B.) Replace Temperature Sensor.
Temperature Sensor reading very high or shows a “#” in place of a temperature reading.	A.) Moisture inside Temperature Sensor junction box causing short. B.) A Break in the Temperature Sensor wire is causing a short. C.) Defective Temperature Sensor.	A.) Remove moisture from Sensor box and recheck temperature. B.) Check Sensor wire and wire connections. Correct any problems. C.) Replace Temperature Sensor.
Temperature readings are not steady (changing half a degree or more every five seconds). It is causing Tunnel Fans and heaters to run at the same time.	There is excessive noise on the Temperature Sensors. This can be caused by not using a Twisted Pair Wire for the Temperature Sensor, running the Sensor wire inside conduit with high voltage wire, or using a shielded wire and grounding the shield.	To prevent noise from bothering the Sensors, use non-shielded Twisted Pair Wire (part no. 42208) and run the wire by itself away from high voltage wires. Preferably the wire should also enter the Control in a separate place from the high voltage wire, but this is not always possible. Do not use Romex, SJO cord, shielded wire, etc. as Temperature Sensor wire.

Equipment and Potentiometer Troubleshooting Continued.....

Problem	Possible Cause	Possible Solution
Water meter not recording.	A.) Loose connection on Water Meter and/or I/O Board on Chore-Tronics® 2.	A.) Check connections and correct.
	B.) Wrong type of Water Meter.	B.) Make sure Water Meter is a dry contact pulsed Water Meter (Chore-Time part no. 13228-GP) and that the pulser unit is working correctly.
	C.) There is excessive noise on the Water Meter. This can be caused by not using a Twisted Pair Wire for the Water Meter, running the Water Meter wire inside conduit with high voltage wire, or using a shielded wire and grounding the shield.	C.) To prevent noise from bothering the Water Meter, use non-shielded Twisted Pair Wire part no. 42208) and run the wire by itself away from high voltage wires. Preferably the wire should also enter the Control in a separate place from the high voltage wire, but this is not always possible. Do not use Romex, SJO cord, shielded wire, etc. as Water Meter wire.
	D.) Faulty I/O Board.	D.) Replace I/O Board.
	E.) Faulty Water Meter.	E.)Replace/repair Water Meter.
Low Water pressure switch alarm going off constantly but water pressure is NOT low.	A.) Wrong style or pressure switch.	A.) Switch needs to be a reverse action low water pressure switch (Chore-Time part no. 46597).
	B.) Bad or loose connection on water pressure switch and/or I/O Board on the Chore-Tronics® Control.	B.) Check connections and correct.
	C.) Faulty switch.	C.) Replace switch.
I2C Alarm.	A.) Loose, mis-align, or defective flat cable.	A.) Check all flat cables and correct or replace as necessary.
	B.) Defective I/O, I2C, or Expansion Board.	B.) Replace Defective Board.
	C.) Expansion Board address Dip Switches set incorrectly.	C.) See **page 87** for correct Dip Switch settings.

Equipment and Potentiometer Troubleshooting Continued.....

Problem	Possible Cause	Possible Solution
MS Board not functioning correctly, or outputs not functioning correctly.	A.) The DIP switches found on the side of the MS board are in the wrong position.	A.) Replacement boards come from the factory with all three DIP switches in off position. If you have an MS board operating switches 17-32 or 33-40 then the DIP switches need to change positions **(See Page 92)**.
	B.) Defective MS Board or Relay Module.	B.) Replace Board.
	C.) Poor I/O NET Connection. between the Relay Box and Main. Box, or between MS Boards.	C.) Check I/O Net Connection.
The lights above the manual switches are dimmer when on in the automatic mode than in the manual mode. Also Lights flash bright for a second in automatic mode.	Normal Operation.	The indicator light is wired directly across the coils of the Output Relay. When the switch is placed in the manual on position the full 24 volts are placed on the coil, causing the light to glo bright. When the Relays are told to come on by the Control in automatic the full 24 volts is applied to pull the contacts in. The voltage is then reduced to hold the contacts in. This causes the light to glo dim. When the Relays are on in automatic mode, the Control occasionally puts full voltage across the coils to assure the Relay is still engaged.
Relays are constantly failing.	A.) Relays are overloaded. Maximum is 1HP.	A.) Reduce load on Relays.
	B.) There is a short in the wiring connected to that Relay.	B.) Find problem in wiring and correct.
	C.) One of the stand-offs holding the Relay module is broken and is causing the board to touch the back plate.	C.) Replace stand-off.
	D.) Voltage from Back-up Thermostat is wrong phase of 220.	D.) Connect other Phase of 220 to Back-up Thermostat.
Pot not responding alarm **(internal pot).**	A.) Gear not making contact with screw.	A.) Loosen Potentiometer assembly mounting bolts and slide until gear makes contact with the screw.
	B.) Gear set screw not tight on Potentiometer shaft.	B.)Tighten gear set screw.
	C.) Potentiometer not connected to Control and/or bad connection between Potentiometer and Control.	C.) Connect Potentiometer to the Control and/or look for bad connection and correct.
	D.) Bad Potentiometer.	D.) Replace Potentiometer.
	E.)First Opening movement too small.	E.) Make Sure that the first opening movement causes at least a 10-count change Potentiometer reading.

Equipment and Potentiometer Troubleshooting Continued.....

Problem	Possible Cause	Possible Solution
Pot not responding alarm **(external pot)**	A.) Main Curtain cable and/or Potentiometer cable caught, or broken.	A.) Make sure that both the Main Curtain cable and the Potentiometer cable can move freely. Make sure Potentiometer cable does not drag on grommet. Make sure there is adequate weight to keep Main Curtain cable taught.
	B.) Return spring frozen or broke inside Potentiometer assembly.	B.) Check Cable wrap on wheel. Repair or replace spring.
	C.) Potentiometer not connected to Control and/or bad connection between Potentiometer and Control.	C.) Connect Potentiometer to the Control and/or look for bad connection and correct.
	D.) Bad Potentiometer.	D.) Replace Potentiometer
	E.) First Opening movement too small.	E.) Make Sure that the first opening movement causes at least a 10-count change Potentiometer reading.
Pot outside limits alarm **(internal pot)**.	A.) Potentiometer has not been calibrated (especially new installations).	A.) Go to the "Setup" screen and scroll down to the Main Curtain calibration to set up the open and close limits of the Curtain.
	B.) Gear not making contact with screw.	B.) Loosen Potentiometer assembly mounting bolts and slide until gear makes contact with the screw.
	C.) Limit switch(es) has been moved on the Curtain machine.	C.) If limit switches have been moved, then re-calibration is required.
	D.) Potentiometer not connected to Control and/or bad connection between Potentiometer and Control.	D.) Connect Potentiometer to the Control and/or look for bad connection and correct.
	E.) Bad Potentiometer.	E.) Replace Potentiometer.

Equipment and Potentiometer Troubleshooting Continued....

Pot outside limits alarm **(external pot)**.	A.) Potentiometer has not been calibrated (especially new installations).	A.) Go to the Setup screen and scroll down to the Main Curtain calibration to set up the open and close limits of the Curtain.
	B.) Potentiometer cable is wrapping around the Main Curtain cable.	B.) Unwrap Potentiometer cable from main cable. Consider installing Anti-twist balls to keep Potentiometer cable from wrapping, or possibly change how the pot cable attaches to the main cable.
	C.) Limit switch(es) has been moved on the Curtain machine.	C.) If limit switches have been moved, then re-calibration is required.
	D.) Potentiometer not connected to Control and/or bad connection between Potentiometer and Control.	D.) Connect Potentiometer to the Control and/or look for bad connection and correct.
	E.) Bad Potentiometer.	E.) Replace Potentiometer.
Pot reading is not stable (changing more than 3 counts when the Curtain machine is not running).	A.) Did not use Twisted Pair Wire.	A.) Make sure that the wire used to connect the Potentiometer to the Control is a twisted pair unshielded wire.
	B.) Ran Potentiometer wire close to, or in same conduit with high voltage lines.	B.) Keep Potentiometer and Temperature Sensor wire away from high voltage lines. When high voltage lines must be crossed, be sure to cross as close to 90 degrees as possible.

IONet Error Addr:xx

This is a communication failure between the Main box and 1 or more of the Manual Switch Boards (iMSCM). The number following the address indicates which board is having the communications issues. These trouble shooting steps assume that the I/O Net alarm occurred on a previously functioning control and no boards have been replaced. Do the following steps:

1. Clear the alarm. See if it reappears in approx. 30 seconds. Check to make sure the same board address appears. If the same address appears go to Step 2. If the I/O Net alarm does not appear at all or the alarm does occur, but at a different address go to Step 3.
2. Open the door to the Relay Box and remove the protective cover plate. **Caution**: **Line voltage will be present!** Check the light in the center of the switch board where the I/O Net alarm occurred to see if it is flashing (normal operation). If the light is flashing go back to Step 1. If the light is not flashing go to Step 4.
3. Power off the Control. Check the polarity of the twisted pair that is connected to the I/O Net terminals in both the main box and the relay box **Caution**: **Line voltage will be present!** Also, check the polarity of the 24 Vdc Twisted Pair in both the Main Box and the Relay Box. Correct if necessary. If the I/O Net alarm is still occurring go to Step 4.
4. Check to make sure that the #1 DIP switch on the IO Board of the Main Box is set to the ON position for 32 and 40 output Controls or to the OFF position for 56 outputs Controls. For all Controls, check that the jumper in the upper right hand corner of the Switch Board closest to the bottom is set to the ON position. Correct if necessary. If the I/O Net alarm is still occurring go to Step 5.
5. Check the routing of the Twisted Pair wire for both the I/O Net and the 24 Vdc. Make sure that Twisted Pair wire is used, the wires are run separately from line voltage wires, and that when the pair does cross line voltage wires it is at a 90 degree angle. Correct if necessary. If the I/O Net alarm is still occurring go to Step 5.
6. Check the grounding of the Control. There should be one ground wire connected from Earth ground to the Ground Rail of the Main Box of the Control. There then should be a ground wire connecting the ground rail of the Main Box to the Ground Rail of the Relay Box. Correct if necessary. If the I/O Net alarm is still occurring go to Step 6.
7. Remove power from the Control. Open the Relay Box and remove the protective cover plate. Check all the terminals of all boards that have had an I/O Net alarm occur. Make sure that all wires from the wiring harness are securely in the correct terminal position and that the screws are tight. Correct if necessary. If I/O Net alarm is still occurring go to Step 8.
8. Replace the Switch Board.

Wiring Diagrams

Backup Control Wiring (24Vdc)

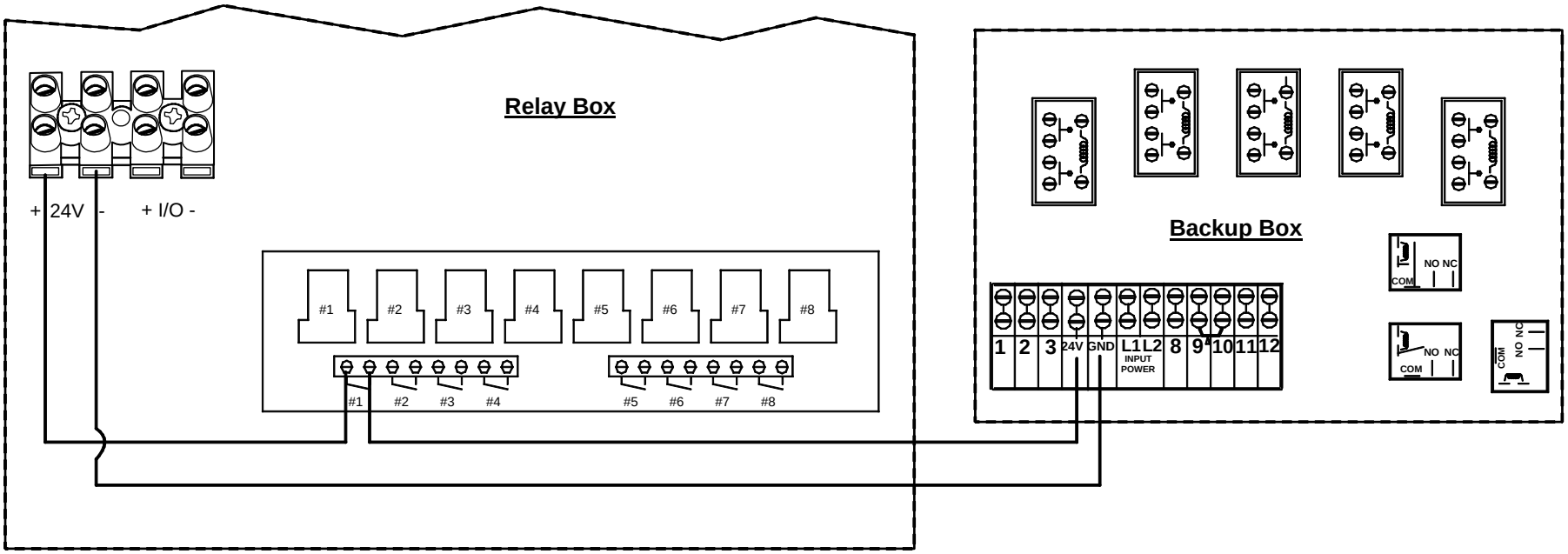
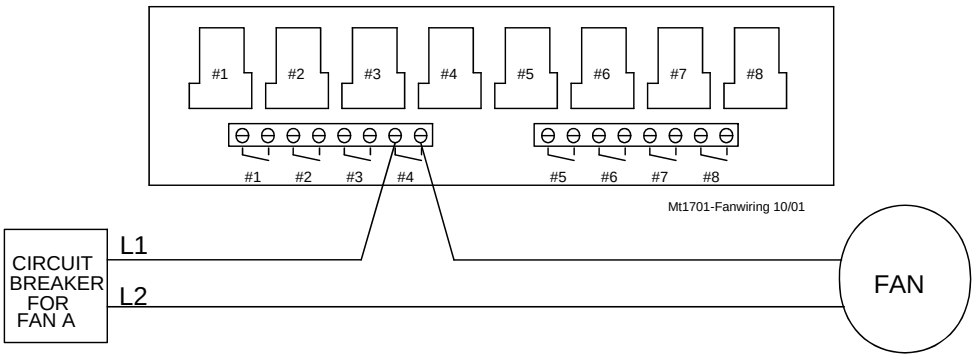


Figure 115. Backup Box Wiring

Fan Wiring

TYPICAL WIRING OF OUTPUT RELAYS

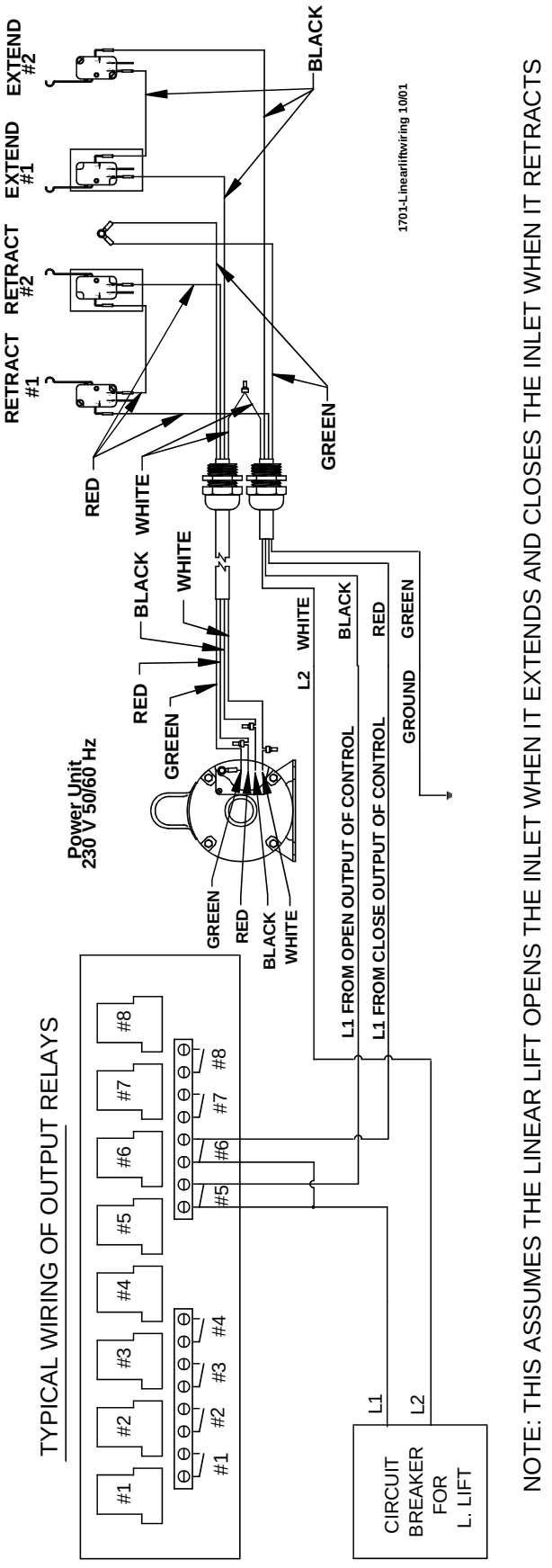


ALL OUTPUT RELAYS ARE SPST WITH DRY CONTACTS AS SHOWN. THIS SHOWS A TYPICAL SITUATION WHERE A FAN HAS BEEN ASSIGNED TO RELAY 4 IN THE SETUP SCREEN.

NOTE: EACH RELAY'S CONTACTS ARE CLOSED WHEN THE OUTPUT THAT IS ASSIGNED TO THAT RELAY IS SUPPOSED TO BE ON.

Figure 116. Fan Wiring

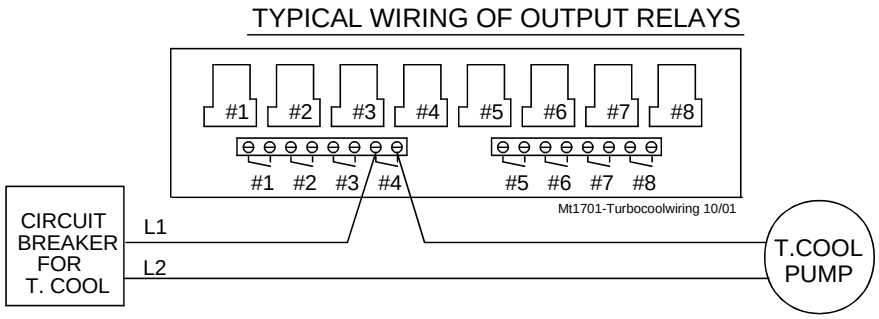
Linear Lift Wiring Diagram



NOTE: THIS ASSUMES THE LINEAR LIFT OPENS THE INLET WHEN IT EXTENDS AND CLOSES THE INLET WHEN IT RETRACTS

Figure 117. Linear Lift Wiring

Turbo-Cool™ Wiring



ALL OUTPUT RELAYS ARE SPST WITH DRY CONTACTS AS SHOWN. THIS SHOWS A TYPICAL SITUATION WHERE THE TURBO COOL PUMP HAS BEEN ASSIGNED TO RELAY 4 IN THE SETUP SCREEN.

NOTE: EACH RELAY'S CONTACTS ARE CLOSED WHEN THE OUTPUT THAT IS ASSIGNED TO THAT RELAY IS SUPPOSED TO BE ON.

Figure 118. Turbo-Cool Wiring

I/O Board Wiring

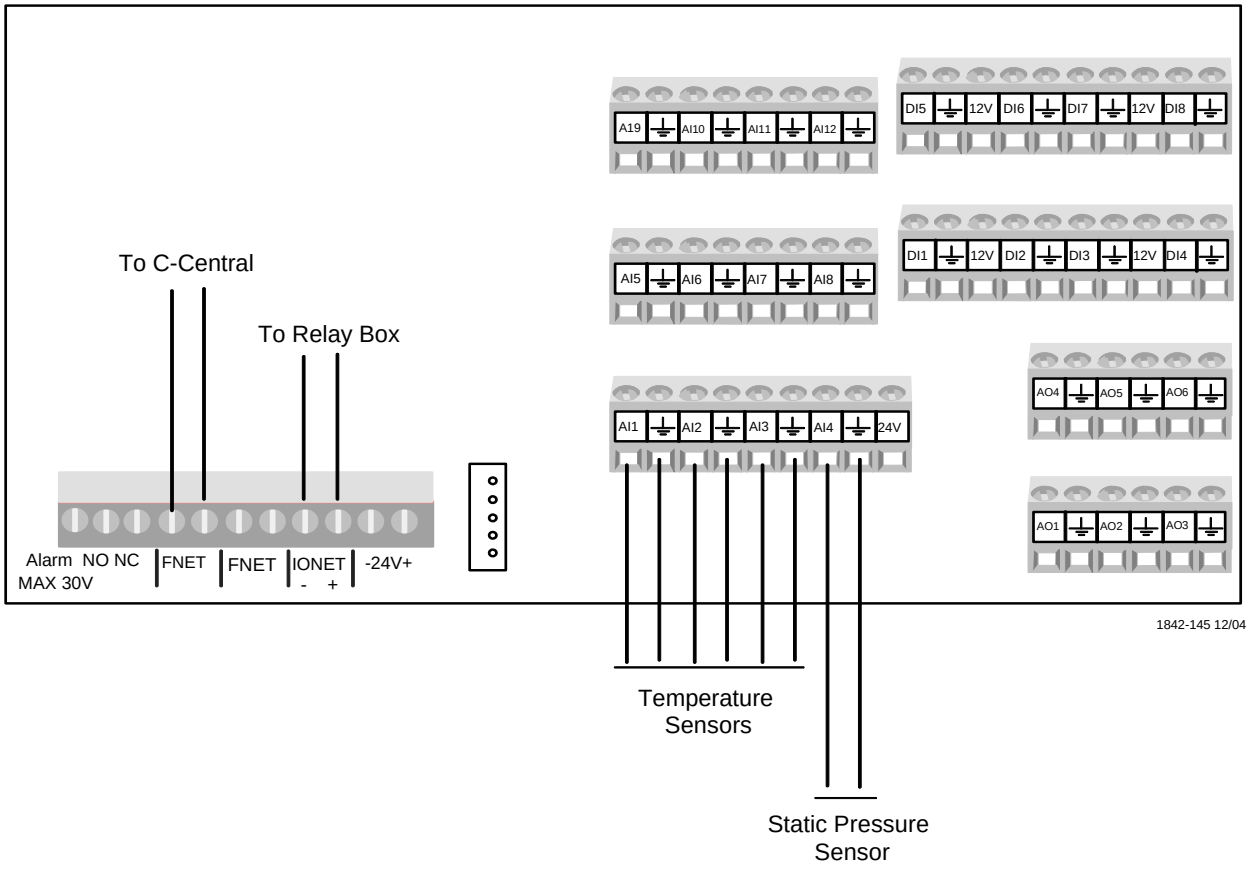


Figure 119. I/O Board Wiring

Weight Bin/Feeder Fill Wiring

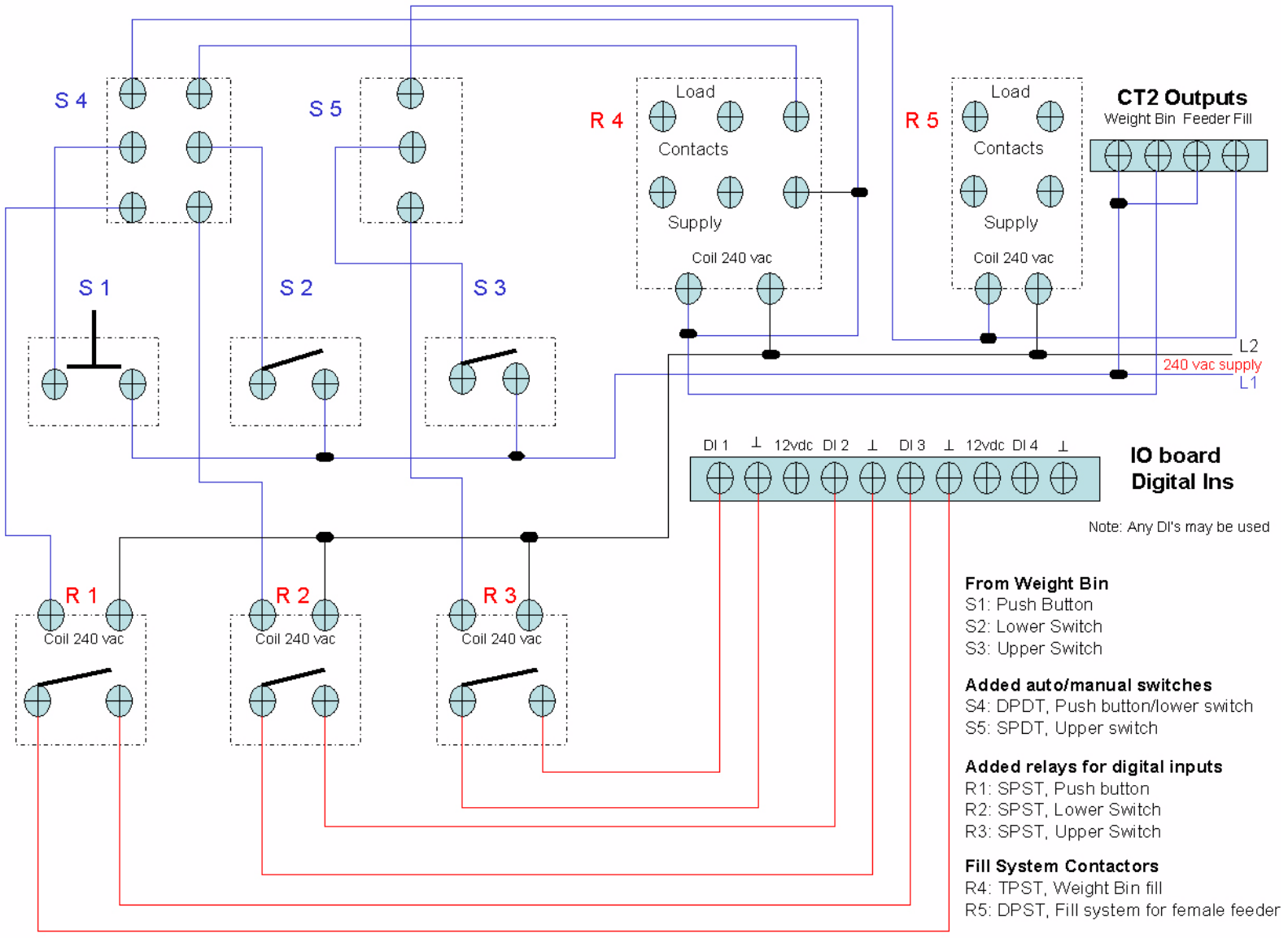


Figure 120. Weight Bin/Feeder Fill Wiring

Backup Egg Room Cooler Wiring

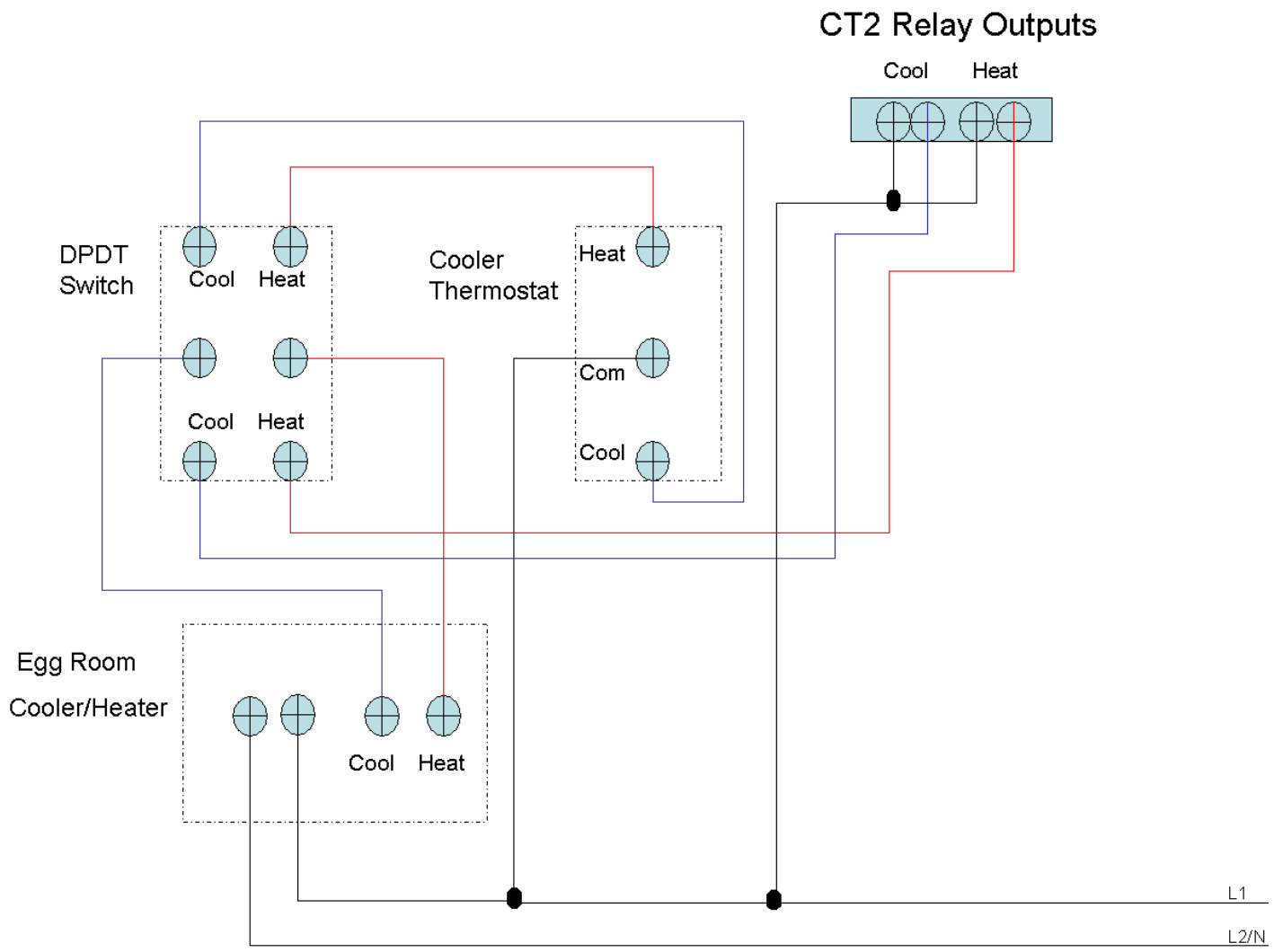


Figure 121. Backup Egg Room Cooler Wiring

Backup Egg Room Humidifier Wiring

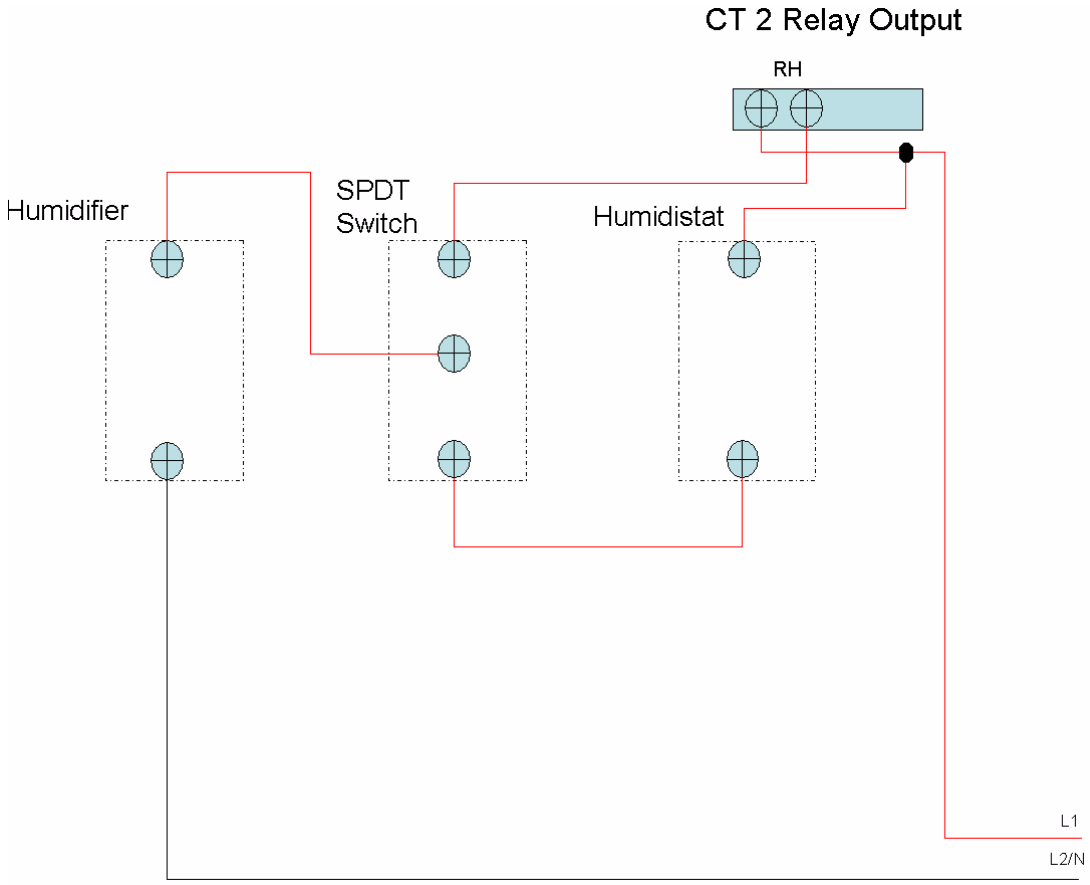


Figure 122. Backup Egg Room Humidifier Wiring

Brooder Wiring; 24 Volt, for 120 Volt AC Supply:
250 VA Transformer runs up to 40 Brooders (Pilot)
250 VA Transformer runs up to 18 Brooders(DSI)

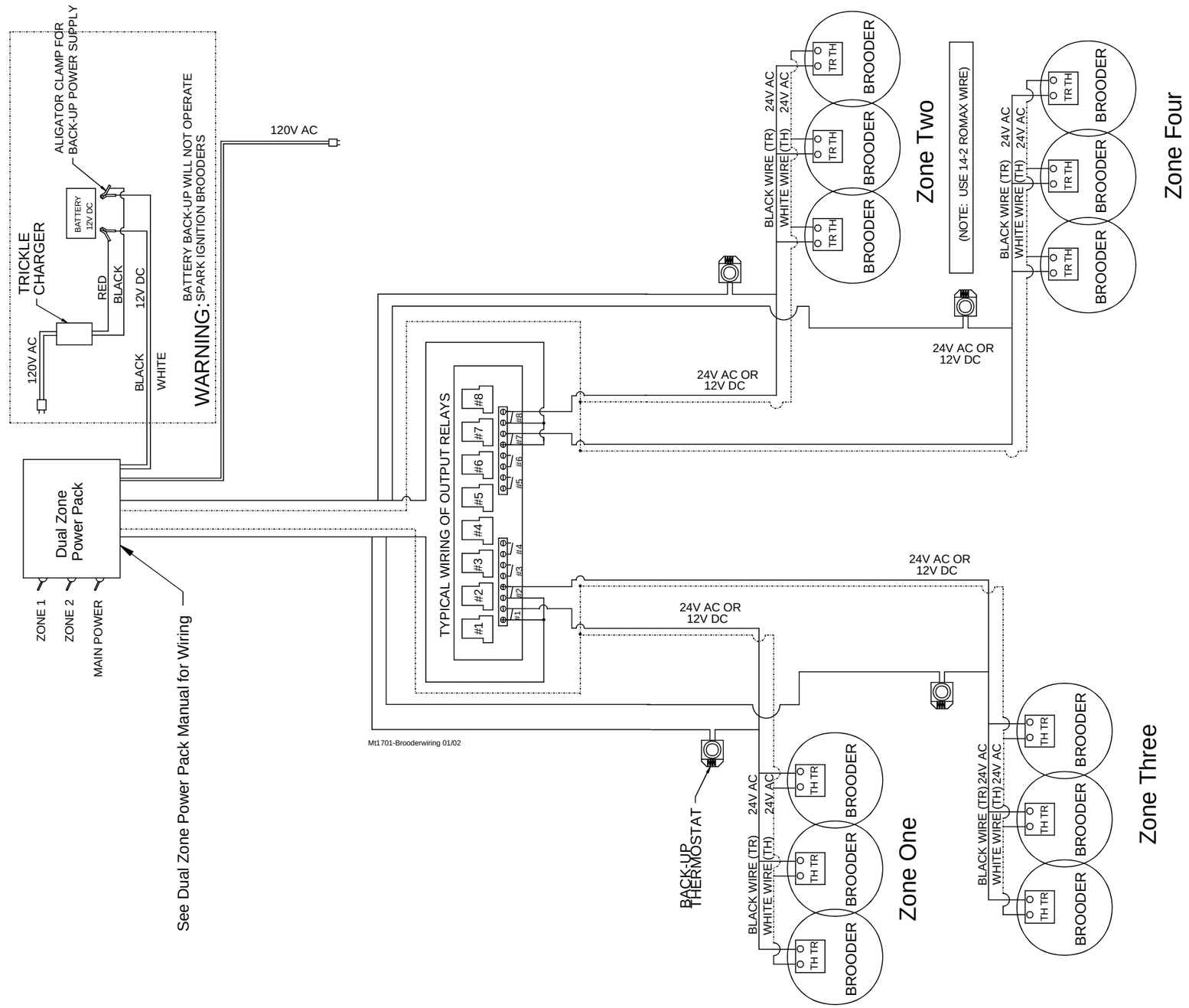


Figure 123. Brooder Wiring

Improving Lightning Surge Suppression

Lightning can be a very destructive and expensive phenomenon. It does not always take a direct "hit" for lightning to cause extensive damage to electrical equipment. The Chore-Tronics® 2 Controls do have components that help suppress and/or isolate power surges such as lightning. These components many times will protect the controls from the power surge or at least keep the damage isolated to one board on the control. However, more direct strikes or strikes that hit network wires such as alarm wires to phone dialers or the C-Central network can cause damage to numerous boards in numerous controls. If the farm is located in a lightning prone area or if there is a network of wires connecting all Chore-Tronics® controls together (such as C-Central or an alarm system), then additional lightning protection should be considered. These products are available from Chore-Time. The products available will be discussed later in this section. It should also be noted that a back-up system consisting of mechanical back-up thermostats be installed in the event of a control failure. Chore-Time has a back-up box available (Part Number 40727).

Before obtaining lightning suppression devices, first check the system grounding of each house/room. Every building needs to have its own ground rod and that ground rod must be driven deep enough into the ground that it will have good contact year round. Please check with the local electrician and/or electrical inspector for specific ground rod requirements in your area. In some areas one ground rod may not be sufficient to provided a good ground to earth, in that case an electrician should be consulted to find alternate ways of obtaining a good Earth ground. Again, be sure to check with a qualified electrician for grounding requirements.

Once a good grounding system has been established, if lightning is still a concern, surge suppressors should be considered. It is recommended that there be a suppressor installed at the main distribution panel for the farm (Chore-Time Part Number 47663) and a suppressor installed on the service panel of each house/room (Part Number 47662). If C-Central and/or an alarm system is used then there should be a low voltage suppressor (Part Number 47660) installed at every control and a telephone line suppressor (Part Number 47661) installed at the phone line on the farm. **See the following pages** for the wiring diagrams and more information on location and installation of these devices.

Installing these devices does not guarantee that the farm will not be struck by lightning or that equipment will not be damaged from lightning strikes. However, they will greatly increase the amount of protection already there, and thus will reduce the chances of having lightning damage occur.

47663 Farm Main Service Panel Surge Suppressor Wiring Diagram

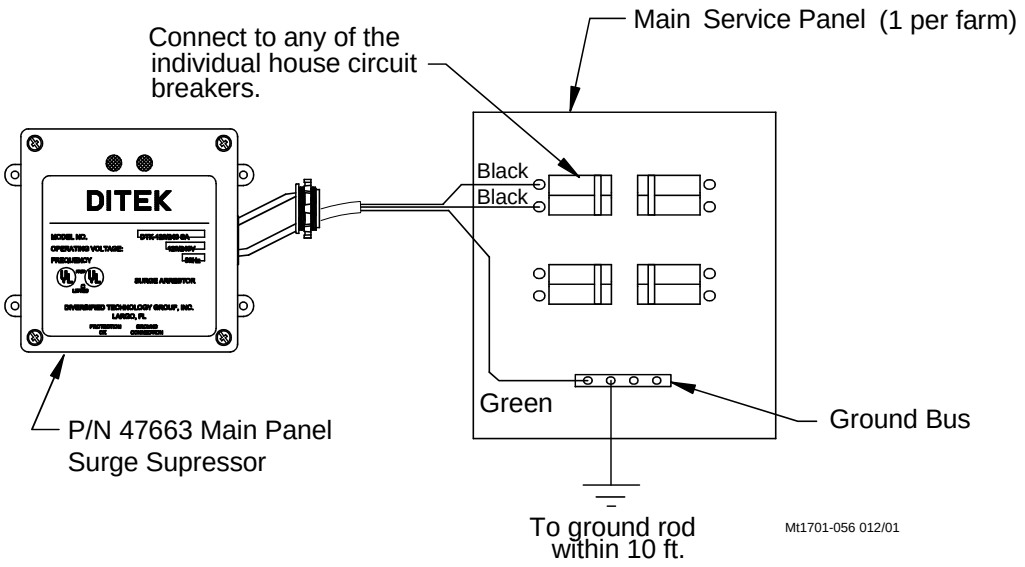


Figure 121. Service Panel Surge Supressor Wiring

47662 House Main Service Panel Surge Suppressor Wiring

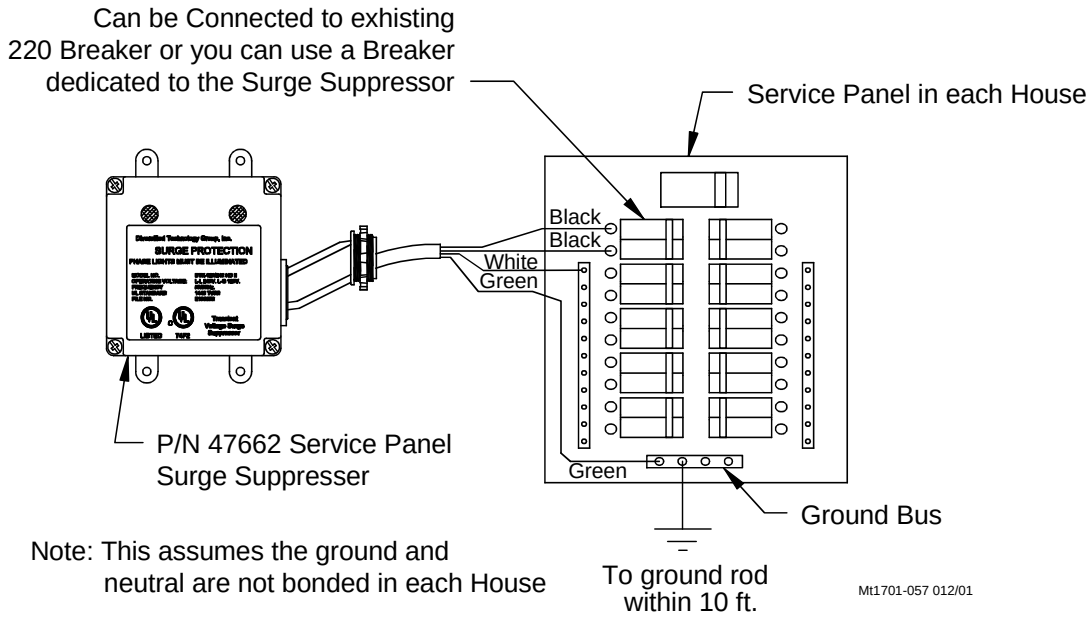
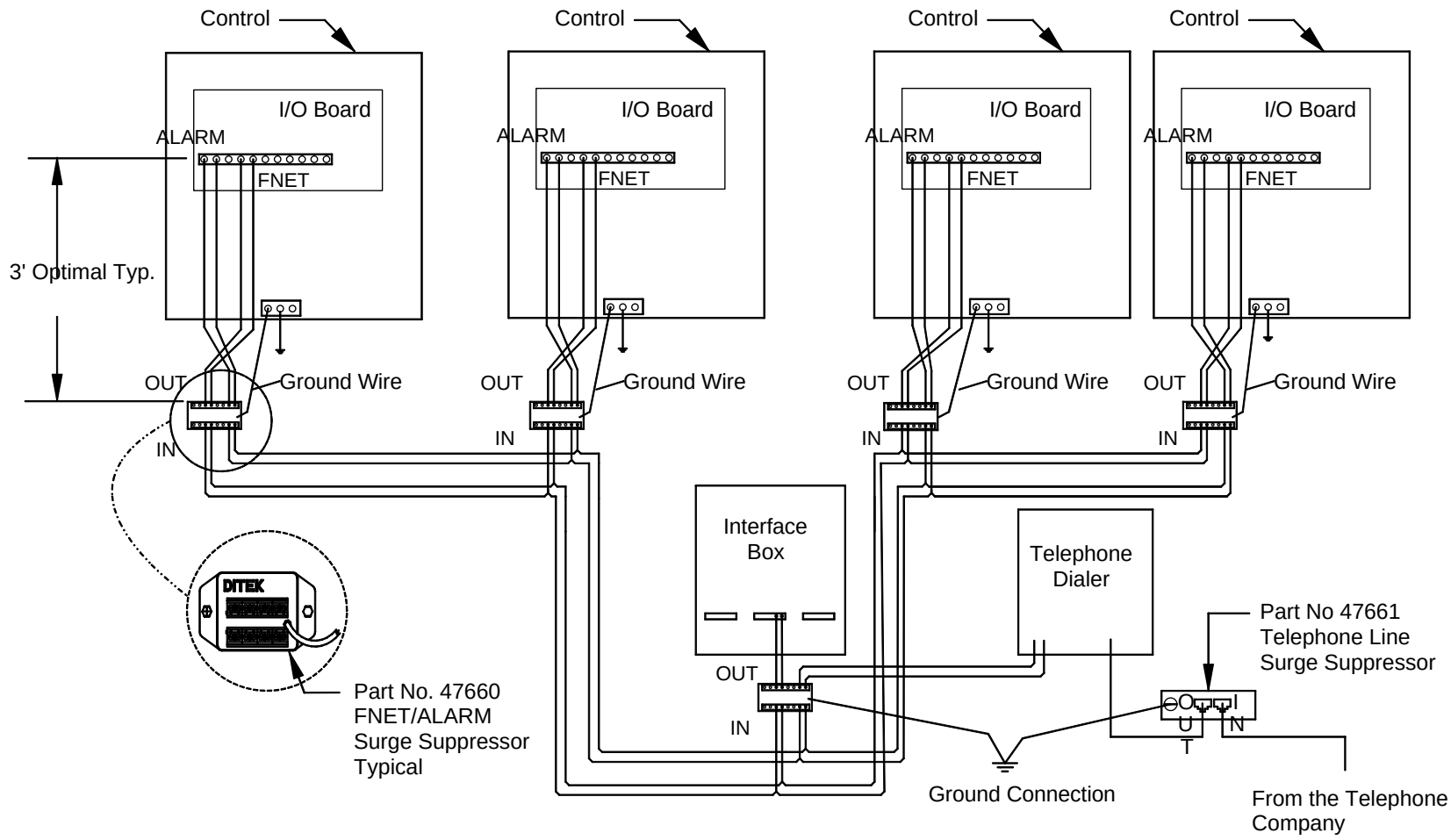

Can be Connected to exhisting 220 Breaker or you can use a Breaker dedicated to the Surge Suppressor
Service Panel in each House
SURGE PROTECTION
Black
Black
White
Green
Green
Ground Bus
P/N 47662 Service Panel Surge Suppresser
Note: This assumes the ground and neutral are not bonded in each House
To ground rod within 10 ft.
Mt1701-057 012/01

Figure 122. Main Service Panel Surge Supressor Wiring

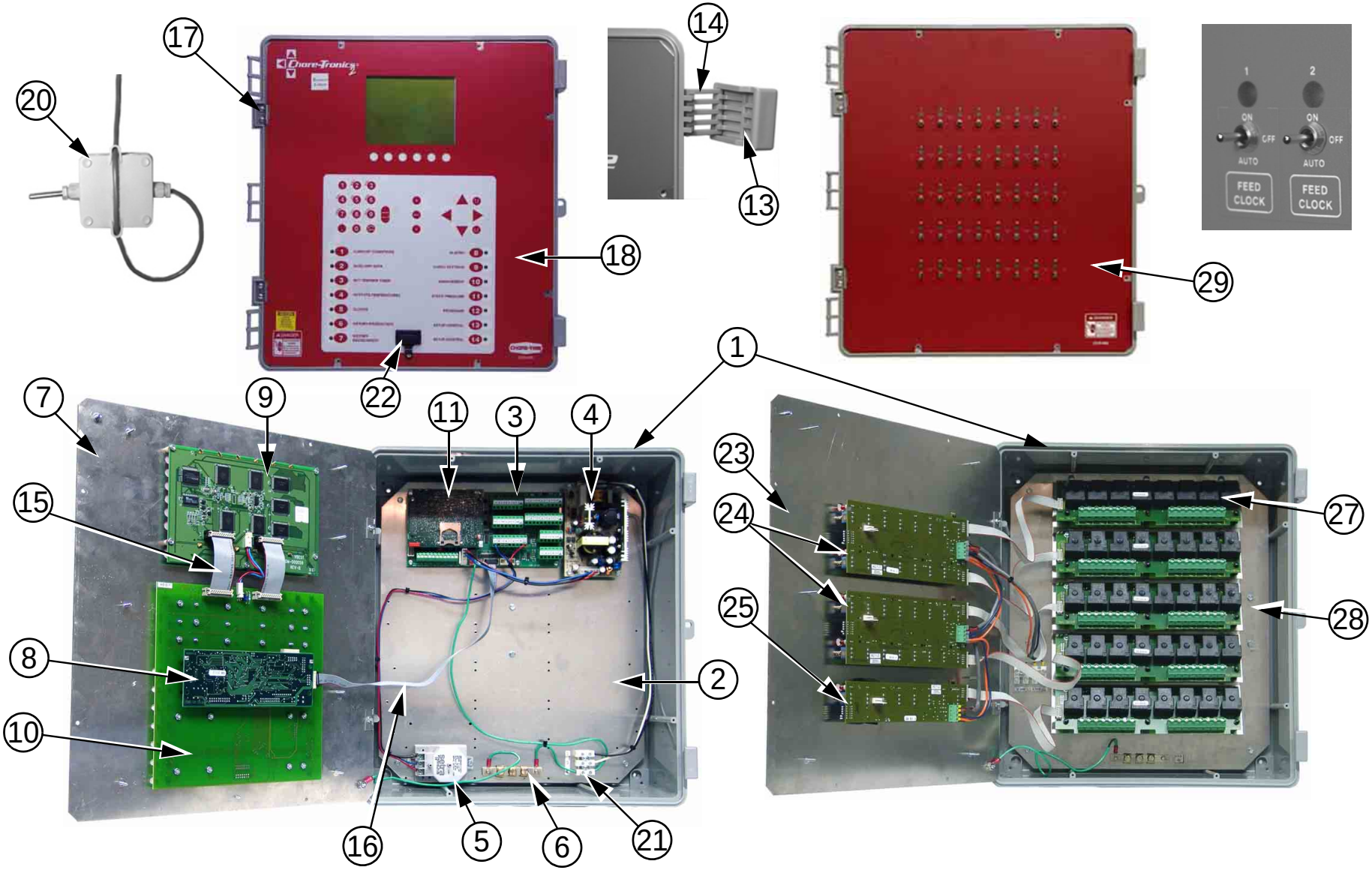
47660 FNET/ALARM & 47661 Telephone Line Surge Suppressor Wiring



Note: There must be a ground rod within 10 ft. of the Ground Terminal of each Surge Suppressor. The wire size from the Suppressor to the ground rod should be 12 gauge or larger.

Figure 123. FNET Alarm and Telephone Line Surge Supressor Wiring

Itemized Parts



Parts Listing

Item	Description	Part No.
1	Electric Box 14 x 16	42684
2	Bottom Plate	49606
3	I/O Board	49984
4	Power Supply	49649
5	Static Pressure Sensor	44743
6	Grounding Rail	43384-2
7	Top Plate	49521
8	HI Basic Board	49983
9	Display	49651
10	KB Board	49652
11	FUNC Board	49674
12	Electric Box Lid (Not Shown)	42683
13	Control Box Latch	30862
14	Control Box Latch Pivot	30863
15	20 Pin 70mm Flat Cable	49745

Item	Description	Part No.
16	10 Pin 400 mm Flat Cable	49746
17	Aluminum Hinge	49482
18	Main Box Decal	2529-839
19	Cover Plate (Not Shown)	41323
20	Temperature Sensor	40741
21	Terminal Strip	34925-3
22	Set-up Key Plug	49724
23	32-40 Relay Top Plate	49491
24	IMSCM.16 Board	49673
25	IMSCM.8 Board	49672
26	Relay Box Cover Plate (Not Shown)	41323
27	RM.8 Board	49646
28	Relay Mount Assembly	41326
29	Relay Box Front Decal	2529-682

Extra Parts and Kits

Analog Input Add-On Kit (Part No. 49663)

Item	Description	Part No.
1	SRS Board Spacer	48742
2	#6-32 x .5" Phil. Pan Head Screw	35367
3	AI.4 Analog Input	49664
4	AI.4 Terminal Strip Decal	2526-461

Digital Input Add-On Kit (Part No. 49665)

Item	Description	Part No.
1	SRS Board Spacer	48742
2	#6-32 x .5" Phil. Pan Head Screw	35367
3	DI.4 Analog Input	49666
4	I/O Terminal Strip 6 Decal	2526-455

Expansion Board Kit (Part No. 49667)

Item	Description	Part No.
1	SRS Board Spacer	48742
2	#6-32 x .5" Phil. Pan Head Screw	35367
3	12C Board	49668
4	10 Pin 250mm Flat Cable	48760

32 to 40 Output Update Kit (Part No. 49669)

Item	Description	Part No.
1	.75" Nylatch Standoff	42530
2	HH #8 x 1.25" Screw	43425
3	.75" Nylon Spacer	46103
4	RM.8 Board	49646
5	Decorative 9mm Toggle Switch Nut	42803
6	IMSCM.8 Red Board	49656
7	.75 x .75 Closed Cell Sponge	49244
8	Model 40 Relay Box Wiring Harness	49747
9	10 Pin 250mm Flat Cable	48760

40 to 56 Output Update Kit (Part No. 49839)

Item	Description	Part No.
1	External Power Relay Supply	49660
2	41-56 Output Relay Box	49644

IMSCM.8 Red Repair Board (Part No. 49672)

Item	Description	Part No.
1	IMSCM.8 Red Board	49656
2	.75 x .75 Closed Cell Sponge	49244

IMSCM.16 Red Repair Board (Part No. 49673)

Item	Description	Part No.
1	IMSCM.16 Red Board	49645
2	.75 x .75 Closed Cell Sponge	49244

FUNC Repair Board (Part No. 49674)

Item	Description	Part No.
1	Blank FUNC Board	49653
2	FUNC Board Decal	2526-459

Input Wiring Assignment Diagram

Use this diagram, which is a copy of the Input Wiring Assignment Decal, located in the Main Box, to record where each Input is wired to the Control.

Board #	Input #	Input Assigned To...
0	AI 1	Sensor 1
0	AI 2	Sensor 2
0	AI 3	Sensor 3
0	AI 4	Static Pressure
0	AI 5	
0	AI 6	
0	AI 7	
0	AI 8	
0	AI 9	
0	AI 10	
0	AI 11	
0	AI 12	
0	DI 1	
0	DI 2	
0	DI 3	
0	DI 4	
0	DI 5	
0	DI 6	
0	DI 7	
0	DI 8	

Technical Specifications

Ambient Operating Temperature Range... 14°F (-10°C) to 122°F (50°C)

Set Temperature Range…. 32°F (4.4°C) to 120°F (48.9°C)

Timer Ranges….
Timer 1 & Timer 2: 0 to 2000 seconds on/0 to 2000 seconds off.
Min Vent Timer: 30-2000 or 0 seconds on/60-2000 or 0 seconds off.
Stir On Time: 0-Min Vent off time.

Supply Voltage……85-264 Vac 50-60hz

Output Relays
Contacts……..SPST Normally Open Contacts

Voltage……250 Vac max

Load…….1 HP@ 240
.5 HP @ 120 Vac
1000 W Incandescent Light Load @ 120 Vac

External Power Output
Voltage……24 Vdc $^{+}$/- 1.5V

Temperature Sensors
NTC Thermister range: -30°C to 50°C/-22°F to 122°F; 10 Kilo ohms @ 77°F $^{+}$/- .7°F

Sensor Wire / PC Wire…….20 gauge single Twisted Pair Wire, 1 twist every 2 inches, unshielded wire. Use of Chore-Time part number 42208 strongly recommended.

Potentiometer (2-wire)…… 0-10KW 10-turns (Natural Ventilation Only)

Static Pressure Sensor (3-wire)…….0-.4 inches w.c. range
0-10v (with resistor installed)

Relative Humidity Sensor (3-wire)……..0-100% RH range
0-5 V signal

Pulsed Water Meter (2-wire)…….Closed contact trigger, No voltage Input

Low Water Pressure Switch…….Low Pressure Reverse-Action Switch.
Settings (on/off) 10/5 PSIG

FNET Data Voltage Range (C-Central)…….$^{+}$/-5 V

Alarm Relay

Voltage…..30 Vac
50 Vdc

Current.... .5 A @ 30 Vac
.5 A @ 30 Vdc

Revisions to this Manual

Page No.	Description of Change
	New Manual

Contact your nearby Chore-Time distributor or representative for additional parts and information.

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